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EDITORIAL COMMENT



WE cannot say we think the Government spokesmen shone at all brilliantly in the debate last week on the charges of extravagance against the Air Ministry. Both Gen. Seely and Mr. Churchill managed to show that the Committee on National Expenditure had been misled on certain matters of detail, but even here it had to be admitted that it was the Ministry's own figures which were to blame for any erroneous impressions. On the graver charges of want of economy and inefficiency in handling the nation's money we completely fail to see that any sort of explanation satisfactory to the public was forthcoming. It is true the Lord Advocate managed to persuade the House that he was not to blame in the matter of the failure to prosecute those connected with the alleged fraudulent conversion of public funds at Renfrew; but his speech was much more

in the nature of a forensic triumph than a real vindication of his Department, and in face of Sir Wm. Hunter's reply, published on Monday, in which the Lord Advocate is practically given the lie direct, developments should be interesting. The public cannot be expected to accept legal casuistry in place of action, and we are still of the opinion that a strong *prima facie* case had been made out for the prosecution of those concerned. Certainly we have seen prosecutions, and successful prosecutions at that, entered on slighter evidence than seems to have been available in the case of Renfrew, and we remain of the opinion we expressed last week—that the failure to proceed was the outcome of a desire to keep back from the public the knowledge of how utterly inefficient was the supervision over the disbursement of public funds. Fortunately, action is to be taken in the civil courts for the recovery of a large sum of money over-paid to the contractor for the works in question, and it may be that during the hearing of this case sufficient evidence will be forthcoming to justify criminal proceedings against those who are alleged to have been guilty of fraud.

"Specific Cases"

Gen. Seely, in trying to justify the Air Ministry, pointed to the sweeping reductions which have been made in the *personnel* of the R.A.F. since the Armistice. Twenty thousand officers have been demobilised, while of "other ranks" 203,000 out of 264,000 have returned to civil life. Out of 386 aerodromes and landing grounds 210 have been given up, and the staff of the Ministry has been reduced by 50 per cent. Of 2,143 hired premises and hotels 1,927 have been given up. "A greater economy in the public service has never been made in the same time" was his boast.

It is good news that the march of economy is proceeding as rapidly as Gen. Seely wants us to believe, but it must be pointed out that the *gravamen* of the charges against the Air Ministry was not that demobilisation and reduction to peace strength are not proceeding rapidly enough, but that during the War and since the Armistice public money has been shamefully wasted—thrown away with both hands, in fact. If the Air Ministry wishes us to believe that it is, by way of being a penitent, confessing its sins and pointing to a new mode of life, so to say, then we are willing to accept it in that rôle; but it seems

to us that all Gen. Seely actually accomplished was to throw a certain amount of dust in the eyes of the House by pointing to the present record and ignoring altogether the main charges. It is an old game, and a very successful one as a rule. It seems to have succeeded more or less on this occasion so far as the House is concerned, but the comments of the Press on the lame explanations indicate that it has not come off so well outside.

Civil Aviation and Native Oil Fuel

The success of civil aviation depends, if not mainly at least very largely, on adequate supplies of suitable oil fuel, readily accessible and cheaply obtainable. It is true that we have hitherto not felt an acute shortage, even during the War, though it is equally true that when the German submarine campaign was at its height there was grave cause for anxiety. It culminated in no disaster, as we know, but one of the prime lessons of the War was that of the necessity for us to render these islands as self-supporting as possible, not only in the matter of food, but of such essentials to the successful conduct of transport as oil fuel. There are, it is true, some things that it is physically impossible to produce, and in that we are not at all singular. It was the blockade which made it impossible for the Central Powers to obtain certain essentials that contributed in no small measure to their downfall.

Oil fuel, it scarcely needs to be said, has attained a position of almost prime importance in the life of the nation. Without adequate supplies of oil the whole of our transport system must break down hopelessly. There can be no development of aviation, either civil or military. Without it the Navy would be paralysed, and even our mercantile shipping would be seriously hampered. All these facts are so self-evident as to be truisms. Fortunately, the War has so driven home the realisation that oil is as essential to our existence as coal that we have really awakened to the necessities of the case, and are at last taking what seem to be adequate measures to develop the undoubted resources we possess within the confines of the British Isles, and, what is more and better, there is reason now to think that before very long we shall be as nearly self-supporting as need be. Apart from any success which may attend the boring operations of Lord Cowdray's company, of which very little has been heard lately, the reports which reach us of the development work proceeding on the Norfolk shales seem to promise excellent results. A number of borings have been sunk in this area, and in some cases liquid shale oil has been tapped at as little as 28 feet below the surface. It is pointed out that this oil must not be confused with crude petroleum, from which it differs both in colour and content. It is evidently a superabundance of hydrocarbon which the shale beds have been unable to take up.

Another remarkable discovery has been made at the test boring at Stow, on the edge of the field. Here the oil shales, at a depth of 130 ft., became of a richness approaching ozokerit, such as is mined in Galicia, but from the appearance even richer. The ozokerit seam at a greater depth became so waxy in its nature that at 200 ft. the core barrel became so firmly wedged that it was impossible to move the drilling rods, and farther sinking was impossible. Naturally, it will not do to assume too much from all these indications, but the main thing is that there is undoubtedly a vast

store of oil contained in these shale beds waiting to be recovered. Nor is there any reason to quarrel with the estimates of competent scientists who appear to be satisfied that, properly worked, the Norfolk shales should make us almost independent of imported oil fuels. It will take a long time and entail a great deal of development work to bring about that consummation, and, in the meantime, it will perhaps be wiser to regard it simply as being certain that there is enough oil below the surface of the country to make a very appreciable difference to our situation. Which, apart from all other considerations, is excellent to contemplate when we regard the way in which the coal situation goes steadily from bad to worse.

The Territorial A.F. Idea

Apropos our article on the formation of a Territorial Air Force in our issue of July 10, we have received a letter from a correspondent who requests us not to publish his communication, in which he complains that the R.F.C. Special Reserve has been very shabbily treated by the Government. He says that according to the terms of the pre-War arrangement, officers of the Special Reserve were to receive £150 per annum, provided they remained in the Corps for a period of four years, attended the annual manœuvres and kept themselves efficient in flying. Now that the War is over he complains, Special Reserve officers are given the choice of whether they will elect to receive a service gratuity on the general basis or take it in the form of deferred Reserve pay. "It is a case of deferred pay or gratuity, not both, though entitled to both," is the way he puts it.

We do not know whether our correspondent voices the general feeling of Special Reserve officers or not. If we thought he were alone in his grievance, we should probably not have referred to it, but as there may be others who feel the same way, we think we are justified in asking why there should be any grievance at all? Our correspondent endeavours to make the point that the £150 a year would have been payable even if there had been no war. Quite so. But he seems to forget that if there had been no war he and his fellow officers of the Special Reserve would not have been drawing active service pay for the past five years. They have received exactly the same service pay as regular officers of the R.F.C. and R.A.F., with the same allowances, all through the War. They are qualified to receive service gratuities on the same scale. The only doubtful point seems to be that of exactly why they are given the option of taking deferred pay in lieu of gratuity. That scarcely matters, however. But we really cannot see why Special Reserve officers should seriously expect to benefit over other R.F.C. officers to the extent of £150 a year during the whole period of the War. It is not at all in derogation of their services to the country that we say we can see no case for rewarding them to the tune of from £600 to £750 each for those services over and above the sums received by others.

One of the points our correspondent endeavours to make is that if it is decided to form a Territorial A.F. the Government should get away from the idea that it can treat its *personnel* as shabbily as it has treated the old Special Reserve. If and when the T.A.F. is formed its officers and men have no more to complain of than he discloses in his letter to us, we do not think there will be any lack of recruits.



MAJOR H. GUY FFISKE, of Messrs. Boulton and Paul, Ltd.

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A Well-Earned Honour

We sincerely congratulate Sir W. Joynson-Hicks on the well-deserved honour bestowed upon him by the King. No baronetcy has been better earned in recent times than this. From the very inception of practical flight the new baronet has been identified very closely with its practical development, particularly as the Parliamentary champion of the freedom of the air and the aerial supremacy of this country. In the days before the War, when officialdom affected to be amused at the aerial developments which were going on before its eyes and when its policy was merely to watch what others were doing in the hope that if the seemingly impossible happened we might benefit from their experience, it was Mr. Joynson-Hicks, as he then was, who, in Parliament, voiced the opinions of those who believed in the new science and who warned the Government of what they were risking by neglecting the tasks which others were endeavouring to carry out. It was he who very shortly before the outbreak of war drew the attention of the public to our utter state of aerial unpreparedness, and convicted the Government of the day of an attempt to hoodwink Parliament and the people in the matter of the number of effective machines we possessed. During the War he took the lead in aerial matters in the House, and it was in no small measure due to his advocacy and insistence that the Air Board came into being and afterwards developed into the Air Ministry as we know it now. His record of service to aviation is one of which he may very justly feel proud.

Economy at the Wrong End

It has been specifically stated by *The Times* that a Government decision has been taken which virtually means that the airship branch of the R.A.F. will cease to exist as a factor in the scheme of aerial defence. This decision is to the effect that no more airships are to be built, and even that work on airships now under construction is to be stopped. Further, it is rumoured that it is intended to wipe out the Civil Aviation Department.

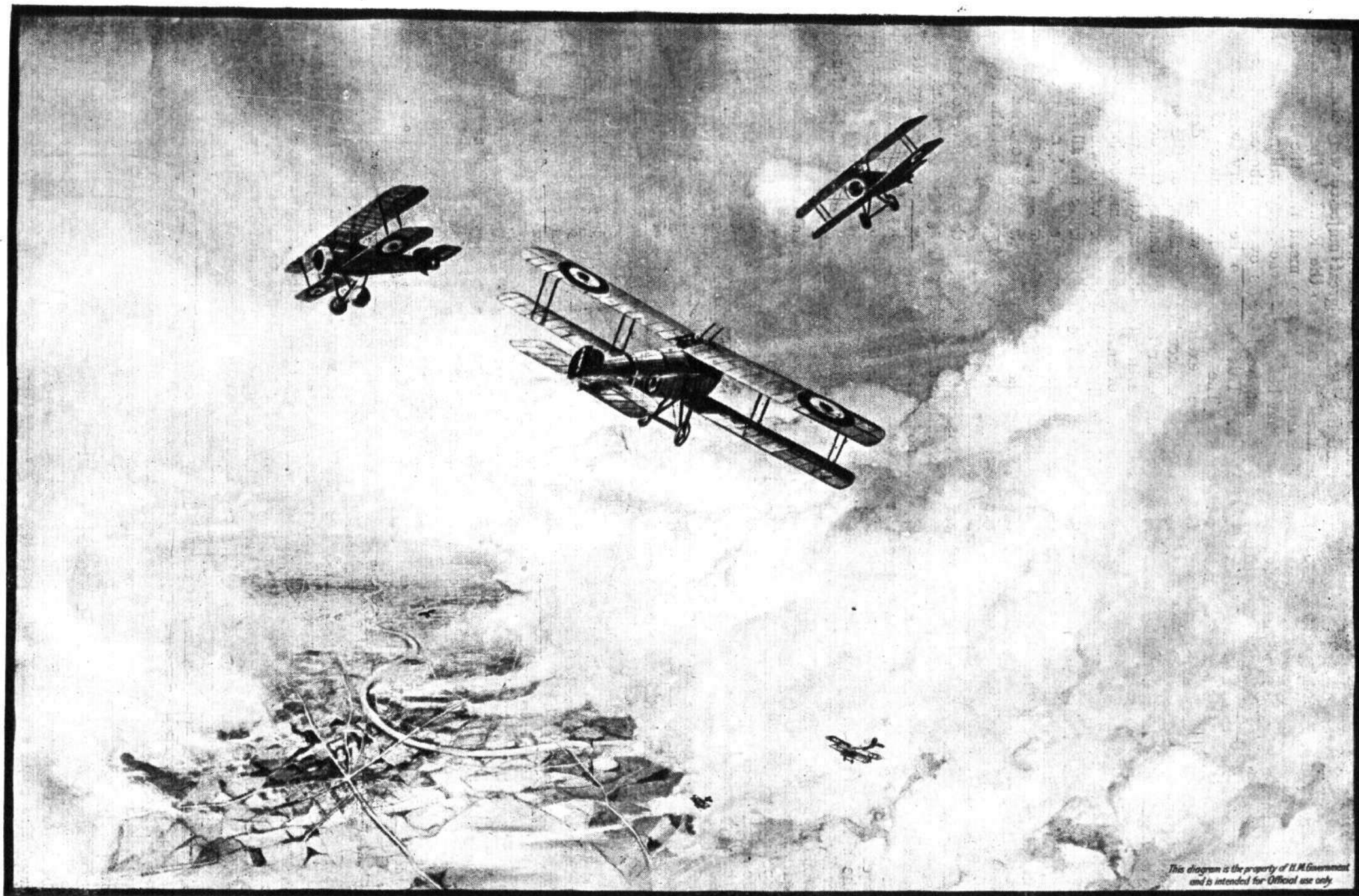
It is almost impossible to believe either the one story or the other. The programme of rigid airship construction was revised after the Armistice and was brought down to the minimum basis required by the Navy for its progressive experimental work of peace time. If the decision then arrived at was right it is not wrong now, and if it indeed be a fact that it is again to be drastically revised—completely reversed would be the better term—all we can say is that the Government is playing fast and loose with national safety. During the latter period of the War, the airship rendered magnificent service and proved its worth for the duties it will in future wars be called upon to perform as a fleet auxiliary. That being so, it is abundantly clear that the Navy must have airships in addition to its establishment of heavier-than-air craft, and to cut down the establishment agreed upon as being necessary for peace time is a suicidal policy. It is all very well to argue that we need not fear another war or to say that in the event of the unexpected happening we can again create the necessary airship services, but we must never forget the price we paid in the late war for our unpreparedness to fight. It is cheaper far to spend money in peace time on preparing for war than to wait until war is upon us and be forced to make up the leeway under such conditions as confronted this country in 1914.

Apart from questions of Imperial defence, it is equally to be argued that the policy announced is unsound and parsimonious from the point of view of commercial development. Undoubtedly the airship has a great potentiality for commercial work, but aviation, both by aeroplane and airship, stands on the threshold of events. In the nature of present circumstances it must look to the State for a certain measure of support during the period of its infantile troubles. In thus stating the case we are by no means indulging in special pleading, since the principle has been admitted by the Government itself not once but many times. We have had it from high authority that not only is this so, but that the necessary support will be forthcoming, not because the Government admits the principle of subsidising industry at large, but because aviation stands in a different relation to the State than most other industries. It is agreed that it is essential from a number of viewpoints that this country should maintain its lead in the air, and, as we have said, it is also agreed that commercial aviation cannot stand alone for some time to come. It goes without saying, therefore, that the case for the keeping of the Government's pledge is overwhelming. We agree that there is urgent necessity for the exercise of the most urgent economy on the part of the State, but there are certain directions in which economy can only be practised as a policy of being penny wise and pound foolish. If these decisions which we are discussing have, indeed, been arrived at they would certainly come under this heading. Unfortunately, they are announced—though we hope erroneously—at a moment when Parliament is on the point of rising for the Recess, and thus they cannot be discussed until the House meets again in October. In the meantime, it is urgently to be hoped that both in Parliamentary and other interested circles, a strenuous campaign against this misplaced "economy" will be prepared. The Department of Civilian Aviation must stand.

Prizes for Commercial Flying

It might be thought, at first sight, that the announcement made by Gen. Seely that the Government will devote £64,000 to prizes for commercial types of aeroplanes is in conflict with the policy of cutting down upon which we have commented. This is not so of necessity. We agree that the Treasury, in sanctioning the allocation of this money and the Air Ministry in asking for it, have shown a commendable sense of what is essential. The sum itself is one that could scarcely have been raised by private enterprise, nor, even if it could, do we think that the competitions which will be announced later would have commanded the same confidence under any other auspices than that of the Government.

The ideas underlying the grant are essentially sound. As Gen. Seely himself said, during the War the paramount necessity in aircraft was military efficiency, but for the successful development of commercial aviation the first essential is safety. Therefore, the main direction in which the prizes will be allocated is in the production of machines having a greater factor of safety and reliability than is possessed by even the most advanced types of to-day. It is impossible until we know exactly what the conditions are to be to do more than approve the basic idea which seems to underlie the action of the Air Ministry, and that we do most whole-heartedly.



"RULES OF THE AIR—MEETING ANOTHER MACHINE."—If a change of course is necessary, turn to the right. (Drawing prepared by the Air Technical Services for use at the R.A.F. Schools.)

We have said that this grant is in no way in conflict with the decisions of misdirected economy to which we have referred elsewhere. With not the slightest desire to appear churlish, we must point out that the announcement of this encouragement programme at the present juncture may even have been calculated to assist in taking the raw edge off the other by enabling the Government to say to the critics of its "economical" policy: "See what we are doing for aviation." We do not like saying this, but the position seems to us to be so serious that it is essential that people should not have dust thrown in their eyes.

The Meteorological Department of the R.A.F.

It is stated on good authority that arrangements are being made for the whole of the meteorological work of the Empire to be undertaken by the R.A.F. Hitherto the study of the weather has been the work of a number of different departments. At the outbreak of war the Meteorological Office was the only British Government organisation devoted to matters and problems connected with the weather. It was under the direction of Dr.—now Sir Napier—Shaw, F.R.S., one of the ablest meteorologists of the time, and was generally admitted to be among the very best organisations of its kind in the world. He it is who is designated head of the new Department. The despatch of the Expeditionary Force to France in 1914 necessitated the formation of a meteorological department to assist the high command, and this was accordingly formed, and proceeded overseas early in 1915. As the size of the armies grew this service was expanded, and became a section of the Royal Engineers, the commissioned ranks being drawn almost entirely from the professional staff of the Meteorological Office. It proved itself of the utmost value to the armies in France, Italy and Salonica. Again, in 1915, a certain number of the staff of the Meteorological Office were commissioned for service with the airship section of the R.N.A.S., and it was this service which ultimately formed the nucleus of the organisation which, after the fusion of the R.N.A.S. and the R.F.C. to form the Royal Air Force, became known as the R.A.F. Meteorological Service.

A few of these officers remained with the Navy, and now constitute the Naval Meteorological Service, though by far the great majority were transferred, as already stated, to the R.A.F. The arrangement forecasted appears to mean that the R.E. service and that belonging to the Navy will now, or in the very near future, pass over to the control of the R.A.F. This seems to be a very wise arrangement. The increasing importance of aviation and the extent to which it depends for success on accurate forecasting of the weather in any particular area lies behind the decision. The single department to be created will eventually form a branch of an international meteorological service, which will give the subject world-wide study and issue reports for the guidance of all. Plans are being made for the organisation of meteorological stations along the great Empire air routes, though how far these plans are destined to fructify is a matter which depends very largely on the attitude of the Treasury.

It is clear that it is work that will have to be done if aviation is to develop along its proper lines. It is of no avail to encourage the use of these routes if that use is to be made doubtful, or even impossible, by the want of reliable information as to the conditions likely to be encountered on any given day. It is not too much to say that the whole future of civilian flying—or Service aviation, for that matter—depends almost as much on the organisation and proper working of a world-wide meteorological service as upon an adequate supply of machines and trained pilots. The one is the complement of the other. As to the movement for co-ordinating the whole of our meteorological services, it is to be welcomed on every account. Instead of having two or three departments, all engaged on the same research work and issuing the same reports, covering a necessarily limited field because of inevitable overlapping, we shall have a single service, under a single head, working towards a single end.

The new Department will come under the Controller-General of Civil Aviation, with its headquarters, in all probability, at the Air Ministry, though it is understood that the expense of the service will be met by a special grant, and will not come within the Air Estimates.

A COMMERCIAL AIRCRAFT COMPETITION

IN the House of Commons on August 14, Maj.-Gen. Seely, in reply to a question by Lieut.-Colonel Malone, made the important announcement that the Government proposed to organise a competition for commercial aircraft and that the prizes would aggregate £64,000. Gen. Seely's statement was as follows:—

"During the war the paramount necessity in aircraft design was military efficiency, but for the successful development of aviation the first essential is safety. The Government have accordingly decided to institute a competition with a view to obtaining a type giving greater safety. Any machine which succeeds in qualifying will represent a great advance

in respect of safety and comfort over any machine at present in use.

"The Treasury have agreed to the competition, and I am sure that, even at this juncture, the House will not grudge the funds for prizes. Prizes will be offered for three types of aircraft—a smaller aeroplane, a larger aeroplane, and a seaplane respectively. In addition to the advantage to civil aviation, the lessons learnt will be of the greatest value to the Royal Air Force.

"The precise terms of the competition will be announced in a few days. If all the competitions are won, the amount required for prizes would be about £64,000."

A Medal for Darfur Operations

AN Army Order announces that the King has been pleased to approve of the forces employed in the Darfur operations accepting and wearing the silver medal, with clasps, granted by the Sultan of Egypt. Those entitled to it include detach-

ments of the R.F.C. who were at Rahad between March 1 and December 31, 1916.

The decorations, when ready for issue, will be forwarded to officers by the Secretary, War Office (A.G. 10), 27, Pilgrim Street, E.C.4, and to other ranks by the officer-in-charge of records concerned.

AERODROMES FOR CIVIL USE AND EMERGENCY LANDING GROUNDS

THE Air Ministry state that the following lists are issued in order to provide the aircraft industry, pilots, and the public with information regarding aerodromes and landing grounds open to civil aviation, and the location of service stations which are not available to civil aircraft except in case of emergency. It should be clearly understood that these lists are purely provisional and are subject to alteration or addition from time to time. Such amendments will be duly published.

In those cases in which it is stated that "accommodation" does not exist, no facilities other than the actual landing grounds are available. No guarantee can be given at the present time that *personnel* to handle aircraft is available either at the Service stations or at the privately licensed aerodromes. The list of aerodromes published on April 25 as being available for civil aviation is now cancelled.

The schedule of prohibited areas published in Air Navigation Regulations, 1919, Schedule 6, remains in force for the present, but a revised list, considerably reducing the number of prohibited areas, will be issued shortly:—

Service Aerodromes only Available for Civilian Machines in Emergency

Aerodrome or sea-plane station.	Nearest railway station and distance in miles.	Postal town and distance in miles.
Andover ..	Andover Junction (1½) (L. & S.W.)	Andover (2).
Baldonnell ..	Lucan (2) (M.G.W. & G.S. & W. Rlys.)	Lucan (2).
Bicester ..	Bicester (2) (G.W.R.)	Bicester (1).
Bircham Newton	Docking (4) (G.E.R.)	King's Lynn (14).
Biggin Hill ..	North or South Bromley (5) (S.E. & C.)	Bromley (5).
Bracebridge ..	Bootham (1) (G.N.R.)	Lincoln (2).
	Lincoln (3) (G.N.R. & G.E.R.)	
Brockworth ..	Gloucester (4) (G.W.R.)	Gloucester (3½).
(S) Calshot ..	Brockenhurst (12) Southampton (15) (L.S.W.R.)	Southampton (15).
Cranwell ..	Caythorpe (4) (G.N.R.)	Grantham (10).
Croydon (Bedding-ton)	East Croydon (2) (S.E.C.R.) (L.B.S.C.R.)	East Croydon (2).
Detling ..	Bearstead (2) (S.E.C.R.)	Maidstone (5).
Donibristle ..	Inverkeithing Bay (2) (N.B.R.)	Inverkeithing (2).
(S) Dover (Marine Parade)	Dover Harbour (½) (S.E.C.R.)	Dover.
Dover (Swingate Downs)	Dover Town (2) (S.E.C.R.)	Dover (2).
Duxford ..	Whittlesford (2) (G.E.R.)	Cambridge (12).
Eastchurch ..	Queenborough (5) (S.E.C.R.)	Queenborough (5).
Farnborough ..	Farnborough (2) (L.S.W.R.)	Farnborough (2).
Flower Down ..	Winchester (3) (L.S.W.R.) (G.W.)	Winchester (3).
Ford Junction ..	Ford Junction (1) (L.B.S.C.)	Arundel (5).
Fowlmere ..	Royston (5) (G.E.R.)	Royston (4).
Frieston ..	Boston (5) (G.N.R.)	Boston (5).
Gosport ..	Fort Blockhouse (L.S.W.R.)	Gosport (½).
(A & S) Grain ..	Port Victoria (S.E.C.R.) (½)	Sheerness (1½).
Halton ..	Wendover (1) (G.W.R.)	Aylesbury (5).
Harlaxton ..	Grantham (4) (G.N.R.)	Grantham (4).
Hawkinge ..	Folkestone (2½) (S.E.C.R.)	Folkestone (2½).
Henlow ..	Henlow adjoining (M.R.)	Bedford (11)
Kingsnorth ..	Beluncle Halt (S.E.C.R.)	Chatham (4).
Larkhill ..	Amesbury (6)	Salisbury (12).
(S) Lee-on-Solent	Lee-on-Solent (½) (L.S.W.R.)	Southampton (11)
Leuchars ..	Leuchars Junction (½) (N.B.R.)	St. Andrews (5).
(X) Manston ..	Minster (1) (S.E.C.R.)	Ramsgate (3).
Marske ..	Marske (1) (N.E.R.)	Whitby (18).

Martlesham Heath	Bealings (1) (G.E.R.)	Ipswich (6).
	Woodbridge (4) (G.E.R.)	
Netheravon ..	Bulford (5) (L.S.W.R.)	Salisbury (13).
North Weald Bassett	North Weald Bassett (½) (G.E.R.)	Epping (2).
Old Sarum ..	Salisbury (4) (L.S.W.R.)	Salisbury (4).
Orfordness ..	Woodbridge (12) (G.E.R.)	Felixstowe (15).
(S) Portland ..	Portland (300 yards) (L.S.W.R.)	Weymouth (4).
Scampton ..	Lincoln (5) (G.E.R., G.N.R., G.C.R.)	Lincoln (6).
Scopwick ..	Scopwick (4) (G.N.R., G.E.R.)	Sleaford (9).
Shrewsbury ..	Shrewsbury (1½) (G.W.R.)	Shrewsbury (1½).
Smoogroo ..	Thurso (thence by boat) (G.N. of S.R.)	Kirkwall (8).
South Carlton ..	Lincoln (4) (G.E.R., M.R., G.C.R., G.N.R.)	Lincoln (3).
Spittlegate ..	Grantham (2) (G.N.R.)	Grantham (2).
Stonehenge ..	Amesbury (4) Salisbury (9) (L.S.W.R.)	Salisbury (8).
Suttons Farm ..	Hornchurch (½) (L.T. & S.)	Romford (5).
Tangmere ..	Drayton (1) (L.B.S.C.R.)	Chichester (4).
(S) Tresco ..	Penzance (thence by boat) (G.W.R.)	St. Mary's (2).
Upavon ..	Pewsey (5) (G.W.R.)	Salisbury (15).
Weston-on-the Green	Bicester (6) (G.W.R.)	Bicester (4).
Worthy Down ..	Winchester (3) (L.S.W.R., G.W.R.)	Winchester (15).
Yate ..	Yate (1) (M.R.)	Bristol (9).

(S) Seaplanes only. (A & S) Aeroplanes and Seaplanes.
(X) Not available for civil use after 1919.

Service Stations Available also for Civil Use.

Castle Bromwich	Castle Bromwich (5) (M.R.)	Castle Bromwich (5).
Coal Aston ..	Beauchief (2½) (M.R.)	Sheffield (3).
(S) Dundee ..	Stannergate (½) (N.B.R.)	Dundee (2).
Eastleigh ..	Eastleigh (1½) (L.S.W.R.)	Eastleigh (1½).
(S) Felixstowe ..	Felixstowe (G.E.R.)	Felixstowe (2).
Kenley ..	Upper Warlingham (1) (L.B.S.C.)	Kenley.
(*) Manston ..	Minster (1) (S.E.C.R.)	Ramsgate (3).
Luce Bay ..	Stranraer (5) (G.S.W.R.)	Stranraer (5).
Pembroke ..	Pembroke (5) (G.W.R.)	Pembroke (4).
Renfrew ..	Fulgar Street (1) (N.B.R.)	Glasgow (5).
Sherburn-in-Elmet	Sherburn-in-Elmet (1) (G.N.R.)	Selby (6).
Shotwick ..	Queensferry (1) (L.N.W.R.)	Chester (6).

(S) Seaplanes only.

(*) Included in "B" List during 1919 only.

Stations Temporarily Retained for Service Purposes, but Available also for Civil Use.

Aldergrove ..	Aldergrove (½) (G.N.I.R.)	Antrim (4).
(A and S) Brough	Brough (½) (N.E.R.)	Hull (12).
Didsbury ..	Didsbury (1) (M.R.)	Manchester (3).
Filton ..	Filton (1) (G.W.R.)	Bristol (5).
Hendon ..	Hendon (1) (M.R.)	Hendon (1).
Hucknall ..	Hucknall (1) (G.C.R.)	Nottingham (6).
Lympne ..	Westenhanger (1) (S.E.C.R.)	Hythe (4).
Montrose ..	Montrose (1) (N.E.R.)	Montrose (2).
Newcastle (Town Moor)	West Jesmond (½) (N.E.R.)	Newcastle-on-Tyne (2).
Tallaght ..	Dublin (7) (G.S. & W.R.)	Dublin (7).
Turnhouse ..	Turnhouse (1) (N.B.R.)	Edinburgh (6).

(A and S) Aeroplanes and Seaplanes.



Map showing the situations of aerodromes for civil use and emergency landing grounds. The signs used are: ● Service aerodromes only available for civilian machines in emergency. ○ Service stations available for civil use. ○ Stations temporarily retained for Service, but available for civil use. ▲ Civil aerodromes already licensed. □ Aerodromes licensed for certain machines only (see list). + Sands. (S) Seaplanes only. (A and S) Aeroplanes and Seaplanes. (X) Not available for civil use after 1919. (X X) Licensed for all but large types of aircraft. (G) Government-owned London terminus.

Civil Aerodromes Already Licensed

(A) Aerodromes at which Accommodation Exists.

(*) Hounslow	.. Hounslow Junction (1) (L.S.W.R.)	Hounslow (2).
Bournemouth	.. Bournemouth (3) (Central L.S.W.R.)	Bournemouth (3).
Cricklewood	.. Cricklewood (1/2) (M.R.)	Cricklewood (1/2).
Cheltenham	.. Churchdown (2) (M.R.)	Cheltenham (4).
Feltham	.. Feltham (1/2) (L.S.W.R.)	Feltham (1/2).
Kingsbury	.. Hendon (1/2) (M.R.)	Hendon (1/2).
Stag-lane..	.. Edgware (1/2) (M.R.)	Edgware (1/2).
Southport (Sands)	Hesketh Park (1/2) (L. and Y.)	Southport (1).

(*) Government owned, London terminus.

(B.) Aerodromes licensed as suitable only "for Avro 504 K and similar types of aircraft," except in a very few instances accommodation does not exist. The licences have also been issued for limited periods only.

Blackpool (Squire's Gate).	Waterloo Road, Blackpool (2 1/2) (L.N.W.R.)	Blackpool (2 1/2).
Brean Down, Weston-super-Mare	Bleadon and Uphill (1 1/4) (G.W.R.)	Weston-super-Mare (2).
(*) Burgh Castle	Belton (1) (G.E.R.)	Belton (1).
Cardiff (Ely Race-course)	Ely Station (1/2) (G.W.R.)	Cardiff (7).
Chichester	Chichester (1 1/2) (L.B.S.C.R.)	Chichester (1 1/2).
Hardwick (near Cambridge)	Lords Bridge (3) (G.E.R.)	Cambridge (6).
Ladies' Mile, Brighton	Preston Park (3) (L.B.S.C.R.)	Brighton (3).
Llanwrtyd Wells	Llanwrtyd Wells (1/2) (L.N.W.R.)	Llanwrtyd Wells, Breconshire (1/2).

British Flying Boat Visits Helsingfors

SOME further details of the trip of the flying boat to Helsingfors, the capital of the new Independent State of Finland, have been given by Major W. G. Sitwell, D.S.C., the commander.

The flying boat used for this trip is interesting as being actually the first F 5 flying boat produced, and was built by the R.N.A.S. at Felixstowe three years ago. New engines of the Eagle VIII Rolls Royce type had, however, been installed. In addition to Major Sitwell, who navigated the boat, the crew consisted of Capt. C. E. Bailey, R.A.F., the pilot, an engineer, and a wireless operator.

The start was made from Felixstowe on July 19, and course set for Copenhagen via Texel, Cuxhaven and across the Kiel Canal—the first occasion on which a British flying boat has flown over it. Rain storms and strong head winds were encountered, and visibility was bad, but this first stage was accomplished in 7 hrs. 35 mins., the engines running beautifully throughout.

Peace night was duly celebrated in Copenhagen and the flight resumed the next morning for Reval. Again strong head winds were met with, and as petrol threatened to run short a course was set towards Stockholm. On the west side of Gotland, however, a following wind was picked up and the flight was continued to Reval, which was reached at 6.15 p.m. on July 20.

Great enthusiasm was manifested by the population at Reval on the arrival of the British flying boat, and considerable delight was expressed by British residents and Naval officers there at receiving a supply of the previous day's English newspapers, which Major Sitwell had brought with him, since the minimum time required for delivery of mails is nine days.

On July 21 the last stage of the journey was flown in much improved weather and the total journey of over 1,100 miles from Felixstowe to Helsingfors was completed in 16 flying hrs., a remarkably good achievement in view of the weather conditions encountered.

A very warm reception was accorded to the British flying officers and crew by the Finns, and official and private entertainments were arranged during their stay. The Cross of the White Rose of Finland was conferred upon Major Sitwell and Capt. Bailey.

Facilities were accorded for inspection of the flying boat, and demonstration flights were given each day to prominent Finns and representatives of the Finnish Press. Among those taken up were: Herr Castren, the Premier; Gen. Kivekas, Chief of Staff of the Finnish Army; Herr Holsti, the Minister

Manstone R.A.F. drome)	(near) Minster (1) (S.E.C.R.)	Ramsgate (3).
Porthcawl	.. Porthcawl (1) (G.W.R.)	Bridgend (5).
Preston	.. Preston (1 1/2) (L.N.W.R.)	Preston (1).
Scarborough	.. Scarborough (1 1/2) (N.E.R.)	Scarborough (1).
Southsea	.. East Southsea (1/2) (L.S.W.R.)	Southsea (1/2).
(*) Stray, Harrogate	Harrogate (1/2) (N.E.R.)	Harrogate (1/2).
Sunderland	.. Monkwearmouth (1) (N.E.R.)	Sunderland (1 1/2).

Situated on Sands—Not available at High Tide.

Blackpool	.. Waterloo Road (1/2)	Blackpool (1 1/2).
Douglas (I. of M.)	Douglas (1/2) (I. of M.)	Douglas (1/2).
Fleetwood	.. Fleetwood (1/2) (L.N.W.R.)	Fleetwood (1/2).
Morecambe Bay	.. Morecambe (1/2) (L.N.W.R.)	Morecambe (1).
Rhyl	.. Rhyl (1/2) (L.N.W.R.)	Rhyl (1/2).
St. Andrews	.. St. Andrews (1/2) (N.B.R.)	St. Andrews (1/2).
Waterloo-with-Seaforth	.. Bootle (1) (L. and Y.)	Bootle (1).

(*) Licensed for all but larger types of aircraft.

At present there are about a dozen aerodromes which are not permanently required for Government purposes. In some cases the buildings, with the land on which they stand, may be acquired without the aerodromes. The property includes the seaplane station in the Shetlands, which cover an area of 12 1/2 acres, and the Gullane aerodrome, in Haddingtonshire, whose area is 318 acres. The Disposal Board of the Ministry of Munitions has information, which is obtainable at Charing Cross Buildings, London, W.C. 2.

of Foreign Affairs; and the Ministers of Commerce, of Communications and Aviation.

All these were much impressed with the possibilities of the British flying boat for transport in Finland and neighbouring countries, and expressed the hope that the visit was but the prelude to the opening of regular communication between Great Britain and Finland.

Passenger Flying Forbidden in Denmark

A MESSAGE from Copenhagen states that the Minister of Justice has published an order forbidding aviators to fly with passengers. Aviators who wish to fly to Denmark must obtain the permission of the Minister of Justice, which must be asked for when their passports are vised.

French Air Losses

OFFICIAL statistics issued in Paris last week show that from August 4, 1914, to November 11, 1918, the losses of the aviation service in the army zones were 1,945 pilots and observers killed, 1,461 missing, whose death may be regarded as certain, and 2,922 wounded. Outside the army zones 1,927 pilots and observers were killed, bringing the total losses in killed and wounded up to 7,757. On December 1, 1918, the full strength was 12,919 men, so the war losses represent 61 per cent.

Figures have also been published which show that the production of aeroplanes was 3,460 in 1915, 7,552 in 1916, 22,751 in 1917 and 34,219 during the first nine months of 1918. Similarly the number of workers employed on building aeroplanes grew from 12,650 on January 1, 1915, to 30,960 on the same date in 1916, 68,920 on the same date in 1917, 131,551 on the same date in 1918, and 186,003 on November 2, 1918.

Mails by Aeroplane to Steamer

FROM New York comes word that the first delivery of mails by aeroplane to a steamship leaving for Europe was accomplished on August 14, when an aeroplane, leaving at 1.30 dropped, at 2 p.m., a mail on board the Adriatic, which had left New York at 12.30 p.m.

Cheaper U.S. Aerial Mails

AN order has just been issued by the U.S. Postmaster-General reducing the rate of postage by aerial mails to 2 cents per ounce, which is the regular rate for first-class mail matter. Aircraft are thus placed on the same footing as other means of transportation of the mails.

A German Exhibition

AT the Leipzig Fair, to be held from August 31 to September 5, there will be an aircraft section, in which the majority of the German aircraft firms have promised to exhibit.



Owing to the unprecedented cable and postal delays the following notes arrived too late for inclusion in last week's issue of FLIGHT.—ED.]

FROM the popular point of view the Eerste Luchtverkeer Tentoonstelling Amsterdam (First Air-Traffic Exhibition), or E.L.T.A., as it is called from the initial letters of its title, looks like becoming a great success. By ferries, steamers, barges towed by tugs, motor boats and craft of all descriptions, the populace of Amsterdam, and of all Holland, for that matter, flows in a daily stream across the IJ from the various piers in de Ruyterkade. Already on the way to the landing wharf one sees the first signs of the exhibition in the form of a couple of Avros, a B.A.T. "Bantam," and a machine which at first one fails to identify, but which later is discovered to be an L.V.G., disporting themselves over the canals and harbours of Amsterdam. Nor is the interest confined to those actually on their way to or from the exhibition. In the town itself there is an epidemic of crick in the neck, caused by constant watching of the sky, and although at the time of writing, the exhibition has only been open for a little over a week, it has had already great educational value, and the Dutch version of the man in the street is quite familiar with the various types, and may be heard to call out—correctly—the names of the machines as they appear between the house-tops of a *straat* or *gracht*. Even in the train, on the way up from the coast, people are asking one another whether they have been, or are going, to the *tentoonstelling*. It cannot be denied that the popular interest in the show is caused to a very great extent by the fact that there is an aerodrome adjoining the exhibition, to both of which the price of admission gives access.

If, as already pointed out, the exhibition is of great popular interest, which is undoubtedly the case, the same can scarcely be said of it when regarded from a technical point of view. This is, of course, chiefly due to the short time that has elapsed since the signing of the Armistice, which has prevented most manufacturers from finishing their post-War designs in time for the exhibition. Also, at the moment of writing, many of the stands are in a state of unpreparedness, owing to the fact that many of the exhibits have not yet arrived, or are in the process of being unpacked or erected.

For this, strikes, transport difficulties and other forms of peace-time frightfulness are mainly responsible, the task of getting the exhibits to the grounds having been, in the case of many of the crews, of herculean magnitude. Thus, to take the case of getting a fairly large machine erected, there are no special derrick facilities, and it is mainly a matter of manpower to get the *fuselage* lifted on to trestles and the undercarriage and wings fitted. To add to the difficulties, most of this work has had to be done with the aid of a great percentage of unskilled labour, to whom, in the case of all but native exhibitors, the giving of orders has had to be done in a curious mixture of English, French, Dutch and a form of Pidgin English invented for the occasion, plus gesticulation according to the requirements of the immediate operation in progress. The situation has been somewhat relieved, however, by the fact that there is a great number of Dutch people connected with the exhibition, in various capacities, who speak English, French, and German fluently, and who are ever ready and willing to render assistance. With their aid the work progresses, and by degrees each stand gradually emerges complete. As regards the difficulties that attended the bringing into the exhibition of very large machines, these will be referred to later.

Although forming parts of the same show, the exhibition proper and the flying ground are best dealt with under separate headings.

THE AIRCRAFT EXHIBITION

The building containing the aircraft and accessories is a large two-span structure, built entirely of wood, as structural steel parts could not be obtained. Its two main doors face towards a large open space, surrounded on the other three sides by the various offices of the direction and management of the exhibition. It might be mentioned that the main building was constructed in two months, which is something of an achievement in a country that is generally thought to take things easily and not to let itself be hustled.

As Germany is excluded, by the terms of the Peace Treaty, from exhibiting—to our mind, a mistaken policy—the aircraft show is represented, at the time of writing at any rate, by four countries:—England, France, Italy, and Holland. As it forms a large percentage of the show,

The British Section

will be dealt with first. In connection with the machines it is worthy of note, and rather significant, that they have, almost without exception, been flown across to the exhibition. In this way very considerable time has been saved, amounting in many instances to days, or even weeks.

THE AIRCRAFT MANUFACTURING CO. (AIRCO),

owing to lack of space, has not been able to show a complete machine, but this is to a great extent made up for by the astounding variety of exhibits displayed on this stand. The centre of attraction is formed by an Airco (D.H.) 16, which is minus its wings but otherwise complete. It is fitted with a Rolls-Royce engine which has seen a great amount of active service, although the casual onlooker would scarcely guess it, as the engine has been cleaned up and painted until it looks like new. The whole machine is very highly finished, what with polished aluminium, glossy enamel and plated fittings and exhaust pipes. The luxuriously finished cabin has seating accommodation for four passengers, the seats being arranged in pairs, of which the seats of each are facing, and staggered in relation to, one another. This feature of the Airco 16 was shown in a photograph published in FLIGHT recently. For communication with the pilot there is a small door in the front wall of the cabin, through which the foremost passenger can give his orders to the pilot. For flying at night the machine is provided with a generator which furnishes current for the navigation lights as well as for the bulbs illuminating the cabin.

In addition to the Airco (D.H.) 16, there is shown on this stand a number of Airco metal fittings and other parts, and the rear portion of a *fuselage*, showing the detail construction. A Napier "Lion" attracts a great deal of attention, as the "broad arrow" type of aero engine evidently is not a familiar sight in Holland.

Another exhibit on the Airco stand which is greatly appreciated is a large glass case containing an excellent model of the Hendon Aerodrome, and a number of small-scale models of Airco machines and of a kite balloon. There is even a neat little scale model of a Hucks starter. A number of large coloured photographs of Airco machines completes the exhibits of this firm. On the aerodrome, however, there are

two Airco machines, a 4A flown over by Capt. Saint and a 9 brought across by Mr. Lawford.

THE BRITISH AERIAL TRANSPORT CO.

is showing two machines, one a B.A.T. "Bantam" with 170 h.p. A.B.C. "Wasp" engine, and the other a diminutive monoplane, called the B.A.T. "Crow," with 30 h.p. A.B.C. 2-cyl. "Gnat" engine. The former machine is well known to our readers, as it was described in *FLIGHT* recently. It is painted in white, as is also the "Crow," and looks very graceful and pleasing to the eye.

The B.A.T. "Crow" is, probably, the smallest man-carrying aeroplane in the world. To those who remember the early days of flying, this machine may, perhaps, be described by saying that it is a Santos Dumont "Demoiselle," designed in the light of modern aeronautical knowledge. The Demoiselle, it may be remembered, was a short-span monoplane, with the pilot placed in a seat below the wings, immediately behind the propeller. This, in effect, is the arrangement of the B.A.T. "Crow," although naturally the detail design and construction is hugely improved.

The A.B.C. Gnat engine is mounted on the leading edge of the wing, and drives a small Ebor tractor screw of about 5 in. diameter. The fuel tank is mounted on top of the plane, and is divided laterally, the oil being contained in the smaller front part, while the rear portion of the tank carries the petrol.

As already mentioned, the "Crow" is a monoplane, and it should be added that the wings are of the cantilever type, with no external bracing. The consequence is that the machine can be dismantled or erected in a few minutes by undoing half-a-dozen bolts. It consists, in effect, of two units: The planes, and the tail planes and booms and the car. The wings, being of the cantilever type, are tapered from root to tip, and are fitted with *ailerons* for lateral control.

Two tail booms, also cantilever beams, of built-up rectangular section carry at their rear end the tail surfaces, and in front are bolted to the wing spars. There is a small symmetrical tail plane and a divided elevator. The vertical fin extends above and below the tail plane, and to it is hinged the rudder. In its present form it would appear that a twisting stress on the tail might be transmitted to the wings and cause trouble, but we understand that in the next machine of this type the tail boom bracing will probably be somewhat altered to overcome this difficulty.

The pilot, as in the case of the Demoiselle, is seated below the wings, but is sheltered to a greater extent than in that machine, being installed in a small *nacelle* not unlike a sidecar for a motor cycle. The controls are of the stick type. The *nacelle* is carried on six steel tubes of circular section, coming down from the wings. Passing through the bottom of the *nacelle* is a flat laminated spring of wood, which carries at its ends short stub axles for the wheels. To the casual observer this arrangement may appear somewhat inadequate, but it should be remembered that the machine is extremely light

(the weight empty is about 220 lb.), and that, therefore, the under-carriage need not be particularly strong, especially as the pilot is seated almost on the ground, and, hence, can judge his landings to a nicety. As she stands, and with a pilot of average weight, the "Crow" weighs, we believe, about 7 lb. per square foot of wing area, and about 10 lb. per horse-power, so that, judging by these figures, the performance should be very good. The machine has not yet been flown, but in view of the fact that the petrol tank is mounted on top of the centre section, *i.e.*, at a point where the lift is probably greatest, the wing loading may prove somewhat on the heavy side, and it might be found advisable to increase the wing area of the next machine slightly.

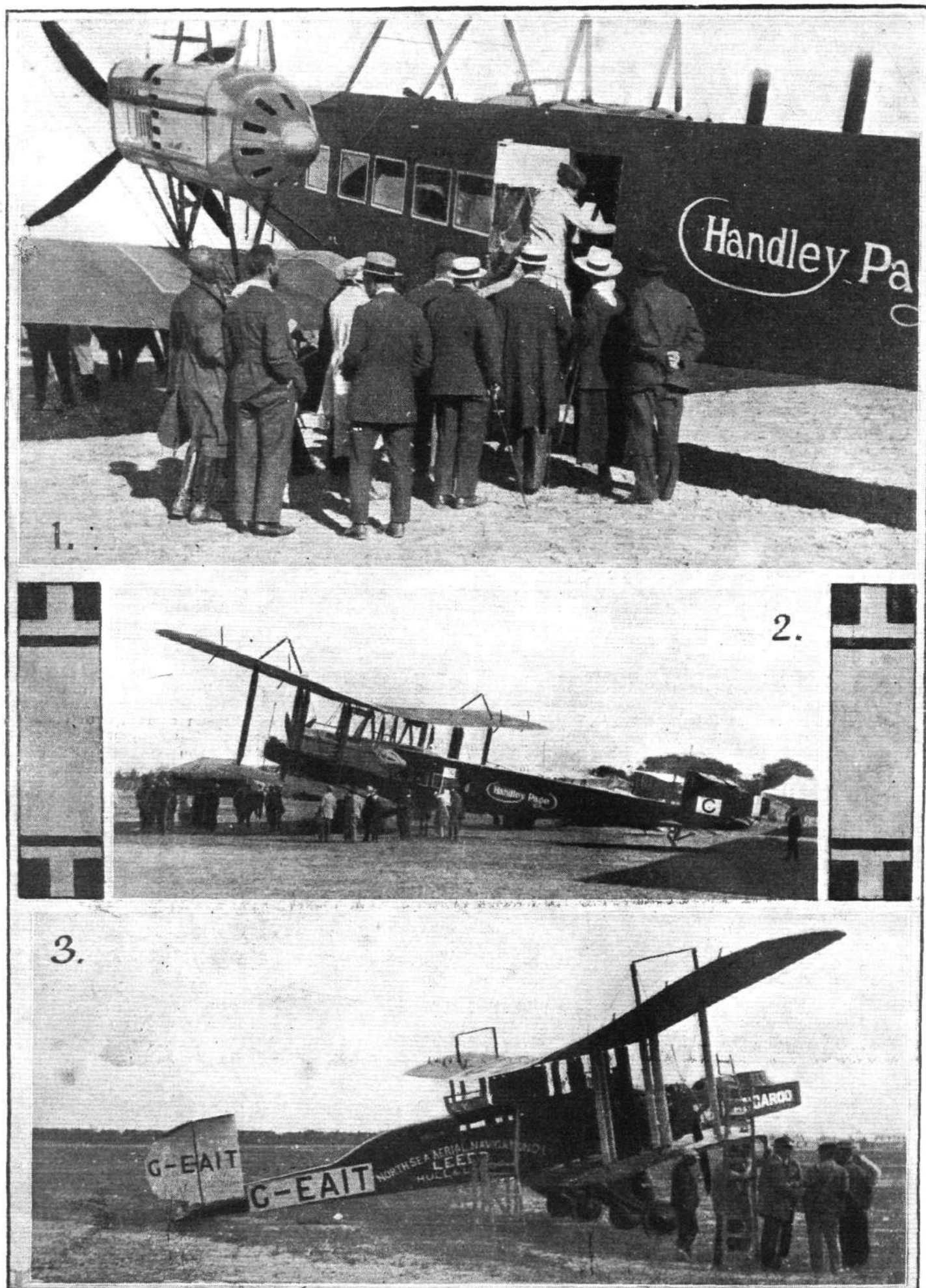
On account of its diminutive size, the "Crow" is one of the attractions of the show, and we understand that an enormous number of enquiries regarding price has been received. The first of these came from a Dutch carpenter working at the exhibition, who quite seriously asked the price as he wanted one of these machines. For use in Holland it is a question whether it would not be possible to design the little *nacelle* as a boat or float, thus enabling the machine to start from and alight on the rivers and canals with which Holland is so plentifully supplied. The flying tests of the "Crow" will be awaited with interest. On the aerodrome are two B.A.T. machines, a "Bantam" and the second machine of the F.K. 26 series.

THE BLACKBURN STAND

The Blackburn Aeroplane and Motor Co., of Leeds, have no space on their stand for exhibiting complete machines. Instead, they are showing three very good scale models. One is of a Blackburn "Kangaroo" (commercial type), with its *fuselage* made deeper in the centre to form a cabin for the passengers. The second model is of a "Kangaroo" type of machine fitted with floats instead of wheels, while the third is a model of a flying boat. On the aerodrome there is now a "Kangaroo" which on Friday and Saturday, August 8 and 9, was flown over from Leeds to Amsterdam by Mr. Kenworthy, who will be remembered as a pre-War pilot at the Beatty School of Flying at Hendon, accompanied by five passengers. The machine left Leeds on Friday, and flew to Hounslow, where the usual formalities were attended to. It then left for Amsterdam *via* Belgium, but was overtaken by darkness and had to land at Brussels, where it arrived at 8.30 p.m. The news of its landing quickly spread, and next morning King Albert of Belgium came out to inspect it. After giving an exhibition flight over Brussels, the "Kangaroo" left for Amsterdam covering the distance between the two cities in 1 hour 35 minutes. A safe landing was made at Amsterdam in spite of the somewhat soft ground, and Mr. Kenworthy succeeded in bringing the machine to her hangar without sinking in, the *modus operandi* being to taxi very fast right up to the tent, thus keeping a fair amount of the weight on the wings and but little on the wheels.

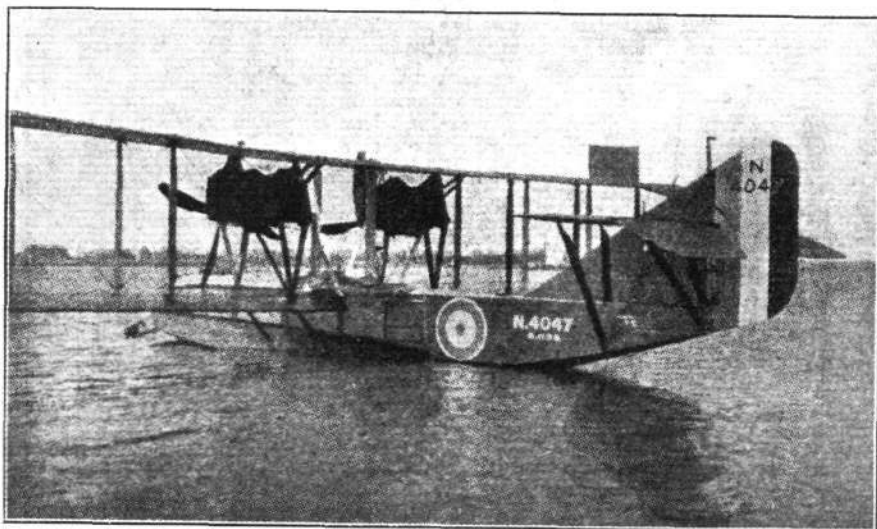


AT THE E.L.T.A.; Major Draper's flying on the B.A.T. "Bantam" is easily one of the greatest attractions of the E.L.T.A. aerodrome. The photograph on the left shows a little group in front of the B.A.T. four-seater. 1. Van Laar; 2. v. Baumhauer, of Van Berkels Patent; 3. Mrs. Noorduyn; 4. Mr. Noorduyn of the B.A.T.; 5. Major Draper; 6. Mr. F. Koolhoven; 7. Mr. A. Mees. On the right, the party which flew across from England to Amsterdam in the Vickers Vimy-Commercial. 1. Lebre; 2. Capt. Cockerell, the pilot of the machine; 3. Mr. W. Mullens, who "filmed" the trip; 4. Mr. K. Muller; 5. Mrs. Mullens; 6. Mr. J. Luger, and 7. Mr. Hans Martin.



"Flight" Copyright

BRITISH MACHINES AT THE E.L.T.A. : 1. Visitors are interested in the Handley Page cabin ; 2. The Handley Page passenger machine ; 3. A Blackburn Kangaroo fitted with a cabin.



A GOSPORT-BUILT FLYING BOAT OF THE F TYPE : This machine, which still belongs to the R.A.F., flew across from England, and is now anchored in the IJ.

THE GOSPORT AIRCRAFT CO.

At the time of writing, the exhibits on this firm's stand consist chiefly of large panels giving particulars of the various types of Gosport flying boats. As these particulars were published in our issue of July 31, 1919, there is no need to repeat them here. One of the Gosport flying boats arrived by air on August 8, and was anchored in the IJ, close to the exhibition, where it was in the company of a large British Royal Air Force flying boat, also, we believe, built by the Gosport firm, although technically belonging to the Air Force. During Saturday and Sunday the small Gosport boat made flights over the river and harbours, to the great enjoyment of the Amsterdammers, who look with interest on any craft connected with water transport, and especially so when such craft combines water and air transport. The little Gosport flying boat gets off very well on the smooth waters of the IJ, and this firm, as being the only one to have a flying boat in commission at present, should do very good business in Amsterdam. During last week this boat was brought up to the show and placed on the Gosport stand.

HANDLEY PAGE, LTD.

This firm is represented, at the actual exhibition, by one machine only, but what the exhibit lacks in numbers it makes up for in size. The machine is one of the V 1500 types, with four Rolls-Royce Eagle engines. The starboard wings are folded back, but even so, the machine towers over the adjoining stands and passages. The V 1500, as so many other

machines, was flown across *via* Brussels, the various stages being covered in the following times:—London to Brussels, 2 hours 40 minutes; Brussels to Soesterberg, 1 hour 25 minutes; Soesterberg to Amsterdam, 25 minutes, giving a total flying time of 4½ hours, as against the 20 hours or so taken by the train-and-steamer mode of travel. Considering the load which the H.P. can carry, this speaks well for the future of commercial aerial transport.

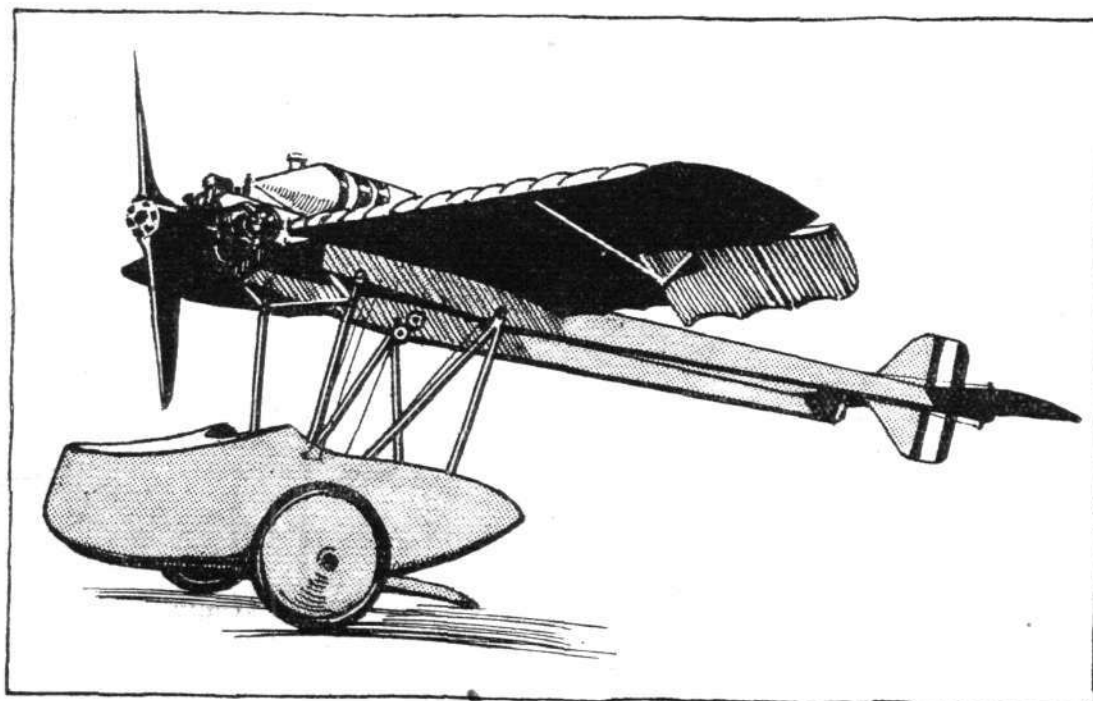
On landing, the Handley Page proceeded to sink into the soft ground of the aerodrome, but luckily no damage was done. There still, however, remained the question of how to get the machine into the exhibition building. In order to do this, it was necessary to take down a portion of the board fence surrounding the aerodrome, to take down the ticket offices in front of the forecourt of the exhibition and other office buildings, and, finally, a portion of the front of the exhibition building itself. All this was done, and the buildings erected again behind the machine. There is certainly this advantage in its size, that there is no fear of anybody coming along after dark and purloining the Handley Page.

Naturally, this huge machine attracts great attention, and there is always a big crowd around it, clamouring to be permitted to look through the trap door in the floor of the fuselage. Mr. Cogni, who is in charge of the H.P. exhibit, is kept busy answering questions, which he does with unflinching good nature, in spite of the fact that some of the queries are not exactly calculated to improve his temper. One bright youth quite seriously expressed the opinion that the machine would fly very lop-sided with one pair of wings sticking back alongside the fuselage. Mr. Cogni agreed that probably it would. Generally speaking, however, the public is showing a very intelligent interest in the various machines exhibited, and the publicity value of the aero show is indubitable.

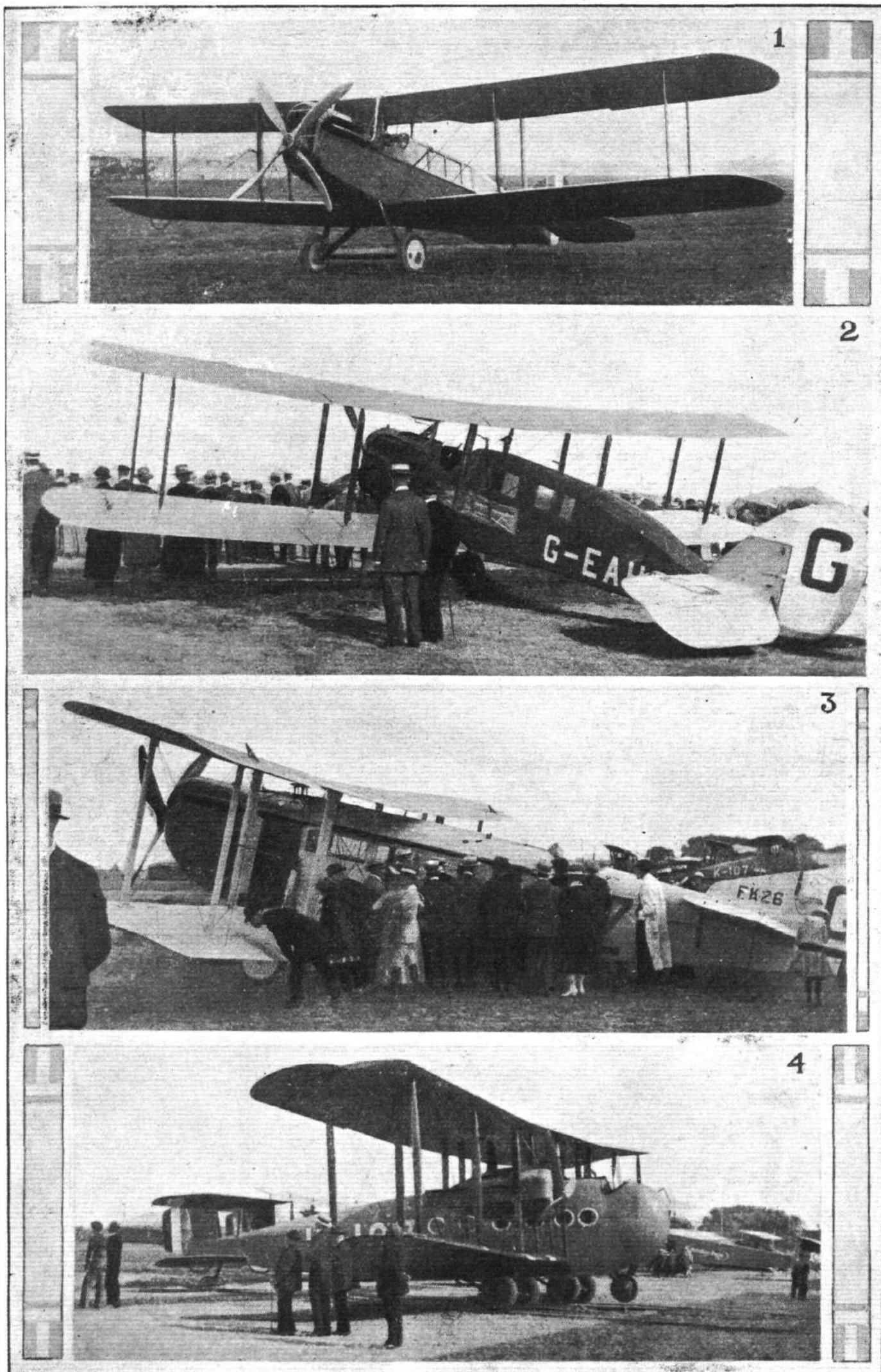
On the aerodrome is one of the 2-engined H.P.s. of the O-400 type, similar to those delivered to the Chinese Government. It has a luxuriously fitted-up cabin seating 14 passengers, who look down upon the country below through a series of windows in the sides. There are curtains over the windows, and for use at night the cabin is lighted by electricity. The machine is also provided with all necessary conveniences. Owing to the present soft condition of the aerodrome, the machine is not doing any flying, but as soon as the ground has hardened sufficiently, there is not the slightest doubt that it will be kept very busy carrying passengers.

A. V. ROE AND CO., LTD.

On the Avro stand, at the time of our visit, there was little to be seen except two gentlemen trying to comfort one another



The B.A.T.
"Crow": This
little machine,
fitted with a 2-cyl.
A.B.C. "Gnat"
engine, attracts
great attention
at the E.L.T.A.
Show. Briefly
speaking, it is a
"Demoiselle"
brought up to
date.



SOME MORE BRITISH MACHINES AT THE E.L.T.A. AERODROME ; 1. The Airco 16, This machine is shown on the Airco stand minus its wings ; 2. The Airco 4A ; 3. The Bat F.K. 26. Note the gentleman examining an aileron hinge ; 4. The Vickers Vimy-Commercial.

"Flight" Copyright.



AMSTERDAM FROM ABOVE: The wide street running down the middle of the foreground is Damrak. The square in the centre is Dam, with the Royal Palace, behind and to the right of which may be seen the post and telegraph office. (Courtesy Het Leven)

with assurances that tomorrow would surely see the arrival of the set of scale models of different Avro machines which they had been awaiting all these dreary days. It was even thought just possible that the little Avro Baby described in FLIGHT recently might be represented at the show before it closes. It seems a pity that it has not been possible to get the Baby to Amsterdam in time for the opening of the show, as this little low-power machine would undoubtedly have appealed tremendously to the Hollanders, especially if they could have had an opportunity of seeing her flying at the aerodrome first. However, the fates have decreed otherwise, and one can only hope that an engine may be obtained in time to have one of the babies there before the closing of the exhibition. If the Avro stand inside the exhibition was suffering from certain shortcomings, for which, needless to say, those in charge were in no wise to blame, these were more than made up for by the Avros on the aerodrome, which were to be seen in the air at all times of the day, and night.

VICKERS, LTD.

The greatest attraction on this stand is, undoubtedly, a Vickers Vimy with two Rolls-Royce engines, similar to the machine on which Capt. Sir John Alcock and Lieut. Sir A. W. Brown flew across the Atlantic in 16 hours. Used as they are to slow water transport, it is inevitable that a machine which has to its credit a sea voyage of such length accomplished in such incredibly short time should appeal to the Hollanders. Also in a sense they felt that the achievement was to a certain extent their own, as there is a Dutch branch of Vickers, Ltd., known as Nederlandsch-Engelsche-Technische Handel Maatschappij, with offices at Vickers House, Hague. The Vickers Vimy has already been described in

FLIGHT, under Vickers "Milestones," to which we would refer readers for details. Another item in which great interest is shown is the fore part of the fuselage of the "Vimy Commercial." This machine also was described in FLIGHT recently, and it is only necessary to point out certain minor alterations that have been effected since the publication of this article. Thus it might be mentioned that the chairs with which the luxurious cabin is now provided are of the wicker work type, and, being somewhat lower than those originally fitted, are, if anything, rather more comfortable, while giving a slightly better view. Another improvement has been effected by transferring the entrance door from the front to the rear of the cabin. With the door in front it was found that the proximity to the revolving airscrew was rather closer than was desirable, and therefore when changing passengers it was necessary to stop the port engine. By now placing the door at the rear of the cabin, behind the trailing edge of the wings, not only may both engines be kept running throttled down while changing passengers, but also the door is actually a good deal lower here in relation to the ground, and it is therefore even easier to enter or leave the cabin than it was before.

Of other items on view on the Vickers stand mention may be made of a model of the "Vimy" standing inside a model Richards hangar, and of a larger scale model of a Vickers "Valentia" flying boat. In addition there are numerous samples of various kinds of Vickers high-speed steels, parts of a Wolseley "Viper" engine, and finally a number of excellent photographs. Out on the aerodrome is a Vickers Vimy-Commercial, to which reference will be made later.

(To be concluded.)



THE ROYAL AERO CLUB OF THE U.K.

OFFICIAL NOTICES TO MEMBERS

HOUSE COMMITTEE

A MEETING of the House Committee was held on Tuesday, August 12, 1919, when there were present:—Mr. J. H. Nicholson, in the Chair, Mr. Ernest C. Bucknall, Capt. R. L. Charteris, Mr. H. J. Corin, Mr. C. G. Greenhill, Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., and H. E. Perrin, Secretary.

COMMITTEE MEETING

A meeting of The Committee was held on Wednesday, August 13, 1919, when there were present:—Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., in the Chair, Mr. Ernest C. Bucknall, Lieut.-Col. Spenser D. A. Grey, D.S.O., Lieut.-Col. F. K. McClean, Brig.-Gen. E. M. Maitland, C.M.G., D.S.O., and H. E. Perrin, Secretary.

New Members.—The following New Members were elected:—

Capt. John Alan Bott, M.C.
Major William Grahame Chambers, R.A.F.
Donald Robert William Gedge.
Lady Sybil Grant.
Lieut. Edgar Wikner Percival, R.A.F.
Lieut. Reginald James Read, R.A.F.
Major Henry Joseph Cecil Smith, R.A.F.
Capt. Francis Edward Fitzroy Smith, R.A.F.
Lieut. Kenneth George Withers, R.A.F.

Flying Services Fund.—On the recommendation of the Flying Services Fund Committee, Col. C. R. Samson, D.S.O., was appointed to fill the vacancy on the Flying Services Fund Committee caused by the resignation of Col. R. H. More.

British Record for Speed in a Closed Circuit.—The following British record for speed in a closed circuit was granted:—

Speed in a Closed Circuit.				Miles per hour.
Date.	Pilot.	Machine.	Motor.	
June 21, 1919.	Capt. G. H. Gathergood.	Airco 4	Napier Lion, 450 h.p.	129.3

Jacques Schneider International Race

The following entries have been received:—

GREAT BRITAIN: Sopwith Aviation Co., Ltd., Kingston. Biplane (450 h.p. Jupiter "Cosmos"); pilot, Mr. H. G. Hawker.
Supermarine Aviation Co., Ltd., Southampton. Single-seater pusher type flying boat (450 h.p. Napier "Lion"); Sq.-Com. B. D. Hobbs, D.S.O., D.F.C.
A. V. Roe and Co., Ltd., Manchester. Single-seater float machine (Siddley-Deasy "Puma"); Capt. Hammersley.

Fairey Aviation Co., Ltd., Hayes. Seaplane (450 h.p. Napier "Lion"); Lieut.-Col. Vincent Nicholl, D.S.O.

FRANCE.—Three entries (particulars not yet available).
ITALY.—"Savoia."

The race will take place on Wednesday, September 10. The course is 200 nautical miles, exclusively at sea, in a circuit of about 20 nautical miles, embracing Bournemouth, Swanage and Christchurch.

Messrs. S. E. Saunders, Ltd., of Cowes, have kindly placed their sheds and slipway at the disposal of the Club for the competing machines.

Australian Government £10,000 Prize for a Flight from Great Britain to Australia.

The following entries have been received:—

Lieut. Bert Hinkler.
Lieut. C. Kingsford Smith and Lieut. V. Hendle.
Mr. Harry Alexander Rigby.
Alliance Aeroplane Co., Ltd.
Martinsyde, Ltd.

The attention of the competitors is drawn to the following supplementary regulations:—

- (1) No start will be permitted until subsequent to September 8, 1919.
- (2) Machines must have a flying range of at least 500 miles.
- (3) A competent navigator must be carried, who may be the pilot.
- (4) Competitors must satisfy the Royal Aero Club that landing places are available.
- (5) At the request of the Australian Government it has been decided that the motor or motors may be changed *en route*.

Air Navigation Regulations and Free Ballooning

The Royal Aero Club has received a letter from the Air Ministry, stating that the revision of the Air Navigation Regulations as affecting Free Ballooning is under consideration.

In the meantime, the Air Council will, on the application of the Club, consider any special exemption required.

Offices: THE ROYAL AERO CLUB,

3, CLIFFORD STREET, LONDON, W. 1.

H. E. PERRIN, Secretary

THE CELLULOSE INQUIRY

At last the report of the Committee appointed to inquire into the formation and financial arrangements of the British Cellulose and Chemical Manufacturing Co., Ltd., and associated companies, and upon their relations with Departments of the Government in connection with the supply of dope, has been issued as a White Paper. It may be recalled that about a year ago the affairs of this company and the relationship between it and various Government Departments in connection with the production of dope were the subjects of much criticism in the House of Commons and the Press, the discussion having been raised by a report from a sub-committee of the Committee on National Expenditure. So strong was the feeling that the Chancellor of the Exchequer asked Lord Sumner, Lord Inchcape and Lord Colwyn to undertake further investigations. The general conclusion is that, though appearances a year ago justified suspicion, careful examination led to the conclusion that it was without foundation.

The Committee point out that the delay in presenting their point has been due partly to the unexpectedly protracted and elaborate investigations of the company's books by Messrs. W. B. Peat and Co., and to the difficulty in securing the evidence of Dr. Camille Dreyfus.

We regret that it is impossible to reprint the report of the Committee in full, but below we give some salient extracts from the report:—

The company was registered in England as a private company on March 18, 1916, with the object of undertaking the manufacture of cellulose acetate and other chemical substances. It was to acquire the Dreyfus British patent rights. It was promoted by Lieut.-Colonel Walter Grant Morden (then Staff Officer to Sir Sam Hughes, the Canadian Minister of Militia), Sir Arthur Trevor Dawson (a director of Vickers, Ltd.), and Mr. Edward Robson (a director of Pinchin, Johnson and Co., Ltd.).

At the outbreak of war the use of cellulose acetate and certain necessary solvents in the manufacture of "dope," for aeronautical purposes was not widely known, and, indeed the aeroplane programme itself was then on a small scale. After the outbreak of war, however, its value was more fully realised, and with the increasing growth in the aeronautical programme the question of supply became important. There were three well-known sources of supply, namely, the Bayer Company of Germany, the Usines du Rhône of France, and the Cellonite Co. (Dreyfus and Co.), of Basle, Switzerland. The Bayer Co. was obviously not available to this country, whilst France would naturally have the first call on the output of the Usines du Rhône.

A considerable part of our inquiry related to complaints made in the interest of the British chemical trade that, instead of having recourse to British manufacturers, or at least giving them an opportunity of sharing in the supply of the desired British product, the Department favoured foreign chemists, entrusted to them the exclusive supply of cellulose acetate, and disregarded the fact that there were numerous objections taken both to the quality of their product and the great delay in the fulfilment of their promises.

That British manufacturers could have overcome the difficulties and have attained the necessary skill and experience in no very long time we need not and do not doubt, but to the time so required there had to be added the further time requisite for equipping the necessary plant on a sufficient scale in the middle of the war. Experience showed that in the case of this kind of plant, as of so many others, that further time would be long. The inquiries made by the Department showed that no chemical concern possessed a plant in being which could have been utilised rapidly for the production of any considerable quantity of cellulose acetate, and although several were confident that they could have reached the manufacturing stage quickly, there was only too much risk that they might be disappointed. Several factories were inspected, and we have taken evidence as to the results of the inspection. The responsible officials came to the conclusion that, if contracts were placed with new manu-

facturers, there would be much delay in obtaining deliveries, and we are satisfied that they had materials before them from which such an opinion might reasonably be formed, nor have we sufficient grounds for holding that opinion to have been wrong.

Another point, in respect of which the course pursued by the Department has been open to criticism, is that the Government was made exclusively dependent for its supplies of acetate upon a company of whose prior production complaints had been made, and that no provision was made for a spare or emergency source of supply of cellulose acetate. There is, however, less in all this than might appear at first sight. Since July, 1915, the Government had been more or less committed to the Dreyfus product. Whatever objections had been taken to it when supplied from Switzerland, we were told that the cellulose acetate made at Spondon was favourably reported upon and proved to be satisfactory. In some cases of objections taken, the evidence suggests serious doubt whether they were justified at all. The delays in getting the Spondon factory to work had come to an end, and from the middle of 1917 onwards supplies came forward regularly and in increasing quantities.

We are of opinion that nothing amounting to favouritism of the company has been shown by the Aircraft Department. It is undoubtedly the fact, as has been shown above, that from the commencement Dr. Dreyfus, and subsequently the company, received support and assistance from Government officials and became, in fact, the sole source to which the Service looked for supplies, but we think the reasons for this are definite. It is worthy of comment that, notwithstanding the transfer of the Aeronautical Department from the War Office to the Ministry of Munitions, and the subsequent change of official personnel, the same policy was adopted, namely, to develop to the utmost capacity the resources of the company's works. An allegation was made to us that the company took employees of the Department into its pay. The authority for this was said to be a statement made by a former employee of the company, but when the latter attended before us he not only declared that the allegation itself was unfounded, but added that he had never made such a statement to our informant. As to an allegation made to us that a subordinate supply officer had received from the company an offer of post-war employment, we have carefully considered the above allegation as against the supply officer concerned, and have come to the conclusion that the evidence before us does not justify it.

In conclusion, we will refer to the criticisms made upon the company last year, which were the origin of the present inquiry. After the publication of the Select Committee's Fifth Report, it is plain that criticism was particularly attracted to the two facts, that the company had received much official support, including loans of public money, priorities, contracts and an Excess Profits Duty concession on the one hand, and, on the other, that its sixpenny shares appeared to be assumed to have become quickly worth £14 10s. each. Hence a connection between these facts was strongly suggested, which alike involved the personal credit of the managers of the company's affairs and of the Departmental officials concerned. The contrast between the nominal capital of the original company and that of the parent company is indeed so glaring that, for much of the criticism to which they have been exposed, we think that the promoters and others connected with the company's financial arrangements have only themselves to thank. In other respects, however, less than justice has been done them. If all the facts, which we have sifted with so negative a result, had been available last year to the critics of the company and its proceedings, we think that their conclusions would, to say the least, have undergone large modification.

It is satisfactory to be able to report that, in our opinion, there has been neither favouritism nor corruption, and that the official action taken has been throughout such as appeared to the Departments concerned the best that was open to them under the circumstances.



Huns Over Denmark

DENMARK is much concerned with German aerial activity in defiance of international law, reported the *Daily Mail* correspondent at Copenhagen on August 15. Two new cases occurred that day. Two abandoned German aeroplanes were found in Danish territory. Two women have been detained on information that smuggling has been going on for some time.

A second breach led to the arrest of a German named Thiele, who was recently refused permission to establish a factory in Denmark to turn out 200 aeroplanes. He desired to establish no fewer than 60 routes linking up the Danish islands. So he evaded the Danish ban by flying the first batch of four machines into Denmark, intending to add gradually to this number.

CIVILIAN FLYING

HOUNSLOW

THE following cross-country flights were successfully carried out on Avros during the week:—1 to Chatham and return, 2 to Brighton and return, 2 to Isle of Wight and return, 1 to Hamble and return, 1 to Swansea. A five-seater Avro was sent over to Eastney Fair for four days, during which time it made 124 flights and took up 388 passengers.

BLACKPOOL, ETC.

FLYING has proceeded as usual at Blackpool during the past week. The weather has been ideal for the "wakes," and large crowds gathered daily to watch the machines. After spending several days in aeroplane gazing they pluck up courage, and, having decided that flying is perfectly safe, they decide to try the air themselves. The Avro five-seaters are doing the bulk of the work, people seeming to prefer the side by side seating family party type of machine to the tandem seater.

Flying has taken place daily at the other Avro stations at Rhyl, Windermere, Southport, Douglas (Isle of Man), etc., and August passenger traffic looks like setting up a big record.

DOUGLAS

AVROS are reported to be as busy as ever at Douglas, round-the-island flights being the latest idea. The first newspaper to arrive by air has been presented to the local museum.

Lieut. Moxon has an ideal spot for pegging his machines down, outside the Castle Mona Hotel, just off the promenade, where other but less up-to-date means of transport, such as cars and cabs, are also parked!

THE NOTTINGHAM FLYING WEEK

THE flying scheme for taking between 2,000 and 3,000 passengers at Nottingham in the middle of September is maturing. The proceeds are to go to a local charity, and it is intended to use the Forest in the centre of the city for the flights which are being arranged jointly by Sir Jesse Boot and the Avro people.

SWANSEA

THE change in the weather of the last few days has made no appreciable difference in the enthusiasm of Swansea for flying. In fact, the low clouds have offered the Avro company an opportunity for showing their enterprise, and a speciality has been made of trips to view the lovely cloud effects over the mountains.

Two minutes after leaving Brynmill sands the earth disappears from view and a remarkable range of cloud mountains stretching interminably in all directions takes its place.

The high winds have not kept the pilots indoors, and many a passenger has expressed the opinion that on a quiet day

flying is monotonous compared to the thrills of flying low over the sands travelling at well over 100 miles per hour.

A large percentage of the passengers take stunting tickets, and frequently the streets are blocked by crowds of holiday makers staring upwards to see a free exhibition of trick flying.

A new five-seater has now arrived, and picnic parties are often to be seen, armed with thermos flasks, alighting from it on the beautiful sands of Caswell and Rossilly Bays.

Llanwitydd Wells is to have its Avro daily for passenger flights, many of which have already been booked.

In connection with this, a most attractive daily excursion has been arranged. No finer scenery can be found in Great Britain than will be enjoyed by the lucky passengers over the Black Mountains.

WESTON-SUPER-MARE

ONE AVRO was in commission here during the week and took up 228 passengers. A good many others, especially one-day trippers from Cardiff, wanted to fly, but had to be disappointed. Another machine, a three-seater, will be available in the coming week, which will relieve the pressure somewhat.

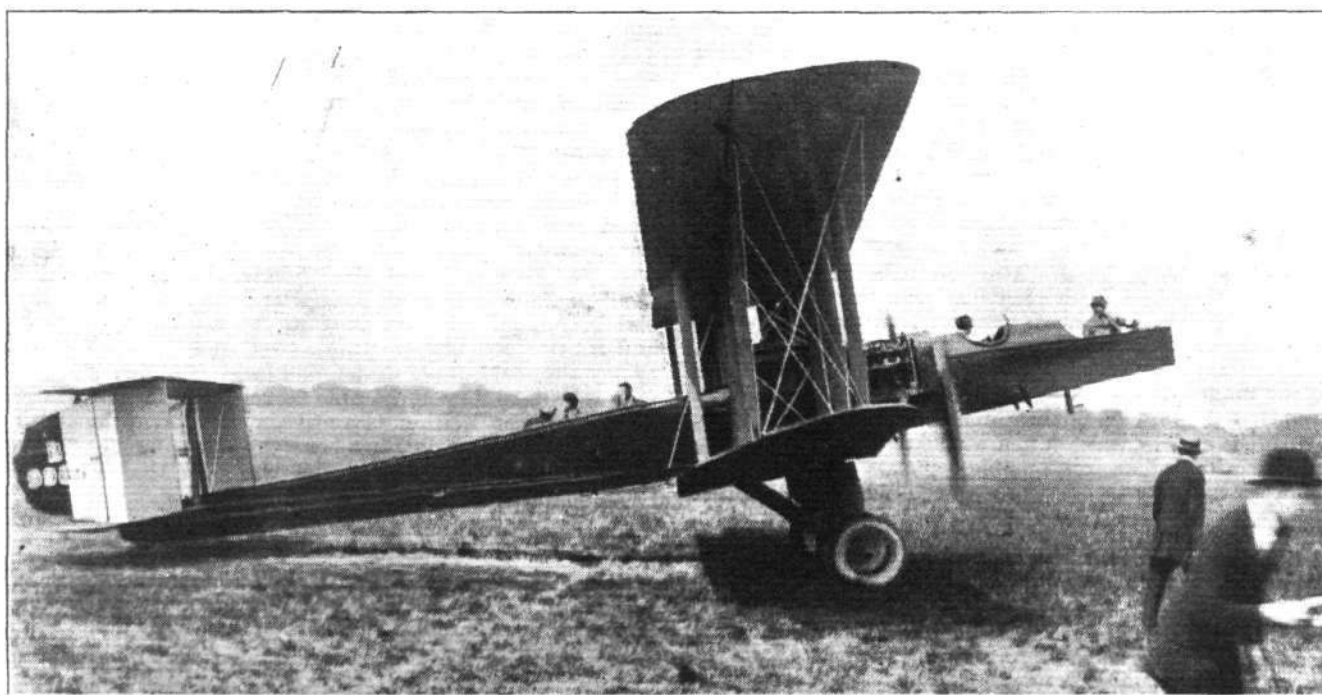
MARGATE

FLYING during the past week has been exceptionally good, the passengers taken up by the Avro machines numbering no less than 232. Arrangements have been made for trips to Folkestone, and these have been in good demand. An Avro now makes trips from Herne Bay on Wednesdays and Thursdays.

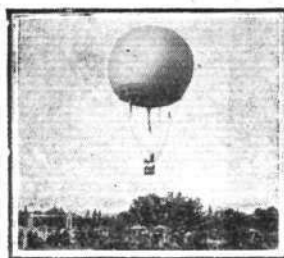
SOUTHAMPTON

SATURDAY last saw the inauguration of the Supermarine flying boat service to the Isle of Wight. The two machines taxied round from their base at Woolston to the Royal Pier, and were kept busy for some time taking prominent officials for trips over Southampton Water. Among others who went aloft were the Mayor and Mayoress of Southampton, the Mayor of Winchester, the Sheriff, the Chief Constable, and many Councillors, including the only lady member, Mrs. Welsh. The programme went off splendidly under the direction of Mr. Hubert Scott-Paine (Chairman and Managing Director of the Supermarine Aviation Co.) and Squadron Commander B. D. Hobbs, D.S.O., D.F.C., was piloting one of the flying boats.

One day last week, when the motor launch service at Ventnor looked like being held up owing to a shortage of petrol, one of the Supermarine flying boats saved the situation by carrying over a sufficient supply of "Shell" motor spirit to enable the service to carry on. It is believed that this is the first instance of delivery of petrol by air.



A HENDON PASSENGER CARRIER.—One of the Grahame-White Blackburn "Kangaroos."



"MILESTONES" (AIRSHIPS) VICKERS

Following up our series of Vickers' "Milestones" (dealing with the heavier-than-air section of this firm) which appeared in FLIGHT for June 12th last, we give this week particulars of the airships produced by Messrs. Vickers, Ltd. Attention may be drawn to the article on "The Possibilities of Airship Transport Services" which appeared in FLIGHT for February 13th last et seq. dealing with the subject as reviewed by Messrs. Vickers, Ltd.

The present airship department was formed in April, 1913, when Vickers, Ltd., were requested by the British Admiralty to put forward proposals for an experimental rigid airship to be of the same size and general type as the types of Zeppelin airships then in service in Germany, and for three non-rigid airships of the "Parseval" type.

At this time, no design data for rigid airships was available, the only information in our hands being a few general exterior photographs of some of the D.E.L.A.G. passenger Zeppelin airships. The firm's representatives visited such of the German airship sheds as were accessible, and picked up such particulars as could be obtained from casual inspection of the exterior of these ships.

It is difficult, when so much knowledge is now available, to realise the magnitude of the problems required to be solved in this initial work. No particulars of weights or of the detail design of the ship components being available, it was necessary to make tentative designs of all parts of the ship in order to obtain approximate data on which the final design could be based. Even the general principle of construction of the hull framework of the German airships was not known, and many different systems were investigated before the final design was determined.

It was specified by the Admiralty that the most important feature of this ship was that she could be specially strong so as to serve primarily as a ship for training crews for subsequent airships, and for this reason it was necessary that she should be designed so as to be able to withstand, without vital damage, shocks and bumps which would be sustained in bad landings. It was also desired, in order to make the ship as simple to handle as possible in getting away and landing, that swivelling propellers should be fitted to the forward car which would enable the ship to be landed by bringing her over the landing ground and pulling down by the propellers whilst she had positive lift, thus making landing a much simpler and safer operation than having to land whilst under way, as is necessary without swivelling propellers.

By the end of 1913 a final design was submitted to the British Admiralty, which, with minor modifications, was approved, and a contract arranged with Vickers, Ltd., for building an airship at Barrow-in-Furness. This airship was subsequently numbered R 9, and was the first rigid airship to be delivered to the Naval Service.

R 9 Class Rigid

The construction of R 9 was commenced at Barrow at the beginning of 1914, when workshops were equipped at Cavenish Dock for the structural work, and half of the old airship shed there partitioned off for the fabric work on the gasbags and outer covers, etc. Experimental work was started on the building of hull girders, but great difficulties were experienced in the manufacture of the thin and light "Duralumin" sections required. At first it was found practically impossible to produce straight angles and channels, and it was only after a long time, and at great expense, that these difficulties were overcome, and the manufacture of girders was enabled to proceed.

In March, 1915, instructions were received from the British Admiralty that the construction was to be suspended, as it was then thought that the war would be over in a few months, and the Walney building shed was commandeered by the Royal Naval Air Service for a flying station.

After the remarkably effective work done by the German Zeppelin airships with their fleet at Jutland and elsewhere,

it was decided by the British Admiralty that R 9 should be completed, and to put in hand further rigid airships of an improved type. The resumption of the construction was greatly impeded owing to a considerable quantity of the previously completed steel wires and other materials having deteriorated during storage, and having to be replaced. The designs of R 9 were at this time completed, and all the difficult manufacturing problems solved, and it only remained to carry on the completion of the airship, which eventually left Barrow on April 4, 1917, after carrying out very successful flight trials over Morecambe Bay.

From that date until the present time, this airship has been stationed on the East Coast of England, and in the words of the Admiralty "has proved to be not only invaluable for the training of officers and men, but also in assisting to carry out the patrol of the East Coast."

Hull Structure.—As previously stated, it was required by the Admiralty that this airship should be designed specially strong enough to be able to stand the rough handling due to inexperienced crews, and consequently the ship could only be made specially strong at the sacrifice of lifting capacity, speed, and performance. After considering various alternative systems of design, it was decided that the most suitable arrangement was to build the hull structure with an exceptionally strong keel girder running along underneath to form a backbone which would take the shocks of landing and distribute them equally over the length of the hull structure, and obviate the risk of serious local damage.

After consideration of various schemes, the keel was eventually designed as a triangular structure built up with steel and "Duralumin" tubes, with ball joints to allow facility of alignment and adjustment. Original types of joints and girders, and a simple method of assembling the former, were evolved by Messrs. Vickers.

The hull structure above the keel was then built of such strength and design as to form a framework to contain the gasbags.

The cars containing the machinery, etc., were suspended from this keel girder in which also all the petrol tanks and ballast bags were carried. The keel served to distribute all the weights over the hull structure.

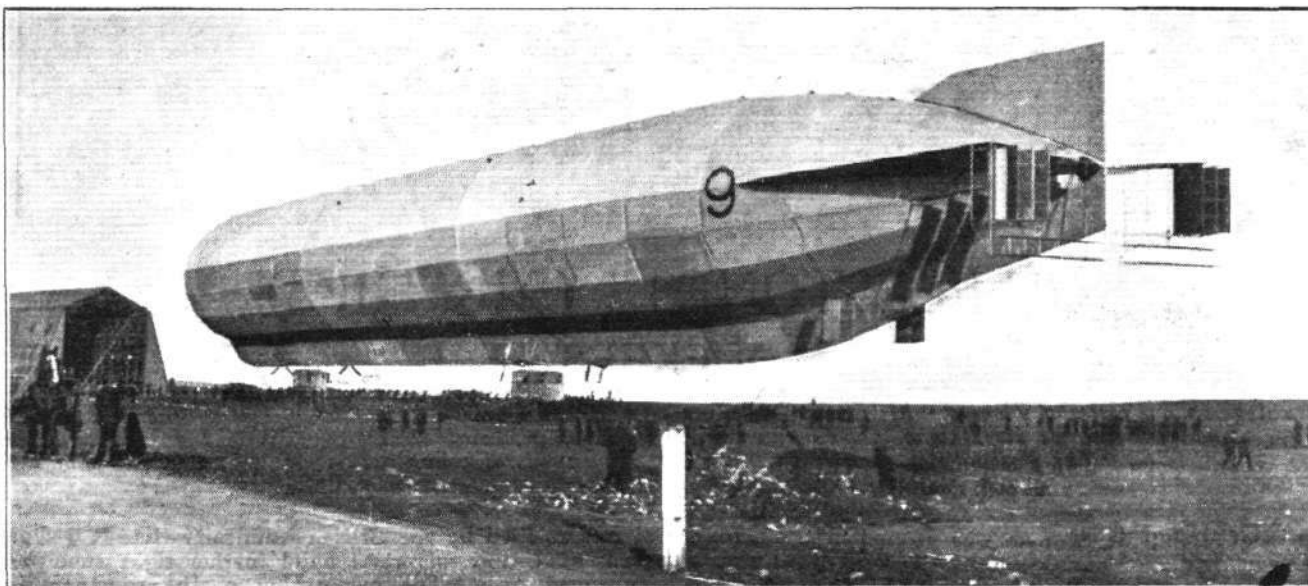
In deciding the shape of the hull, it was resolved as preferable to make the structure with as great a length as possible of parallel diameter with a good-shaped nose and stern end, it being considered for the first ship that it would be much better to obtain relative simplicity of design and manufacture rather than attempt a good streamline shape with a consequent complexity in design and erection.

There are two cars slung underneath the keel, viz.:—

(a) **The Forward Control and Machinery Gear**, which is divided by bulkheads into a control compartment and machinery compartment. The control compartment is of a suitable size to contain all the navigating and other controls, and it is provided with a large number of Triplex glass windows to enable the pilot to have a good all-round vision. The machinery compartment contained two engines driving the overhead swivelling propellers.

(b) **The Aft Car.**—This car was similarly divided into a control and machinery compartment to the forward car. The control compartment was fitted with duplicate controls to those in the forward car, to form an auxiliary or emergency control station.

The cars were of a moderately good streamline shape as limited by the requirements of a simple constructional design,



The first Vickers Rigid to be put into Service, the "R. 9."

and were provided with double water-tight bottoms to enable them to float on the sea. Inflated buffer bags were also provided under each of the cars to act as shock absorbers when landing on the ground.

Machinery Installation.—The forward machinery car was fitted with two 180 h.p. each "Wolseley-Maybach" engines, driving through clutches, bevel gears, and vertical shafts to overhead swivelling propeller gear, supported from the keel girder. This swivelling propeller gear was of a special design, covered by Vickers' patents, which enabled the propeller torques to be balanced so as to enable the A-bladed propellers to be swivelled easily by hand gear when the engines were driving at full power. The arms of the swivelling gear were so mounted as to enable them to be rotated completely round whilst driving at full power, so enabling the thrust to be changed from ahead to astern, up or down, or in any intermediate direction immediately, by the control of the pilot.

The engine fitted in the aft car was a 240 b.h.p. "Maybach," driving a two-bladed propeller mounted at the aft end of the car through a reduction gear-box.

Cabin.—A cabin was provided at the middle of the keel girder giving ample room for the wireless cabin and for sleeping and messing quarters for the crew.

Gasbags.—In the gasbags of this ship the novel system of lining rubber-proofed cotton fabric with an inside layer of

gold-beaters' skins was tried for the first time, and was found to be a great success, giving the gasbags a much greater gas tightness than has hitherto been attained.

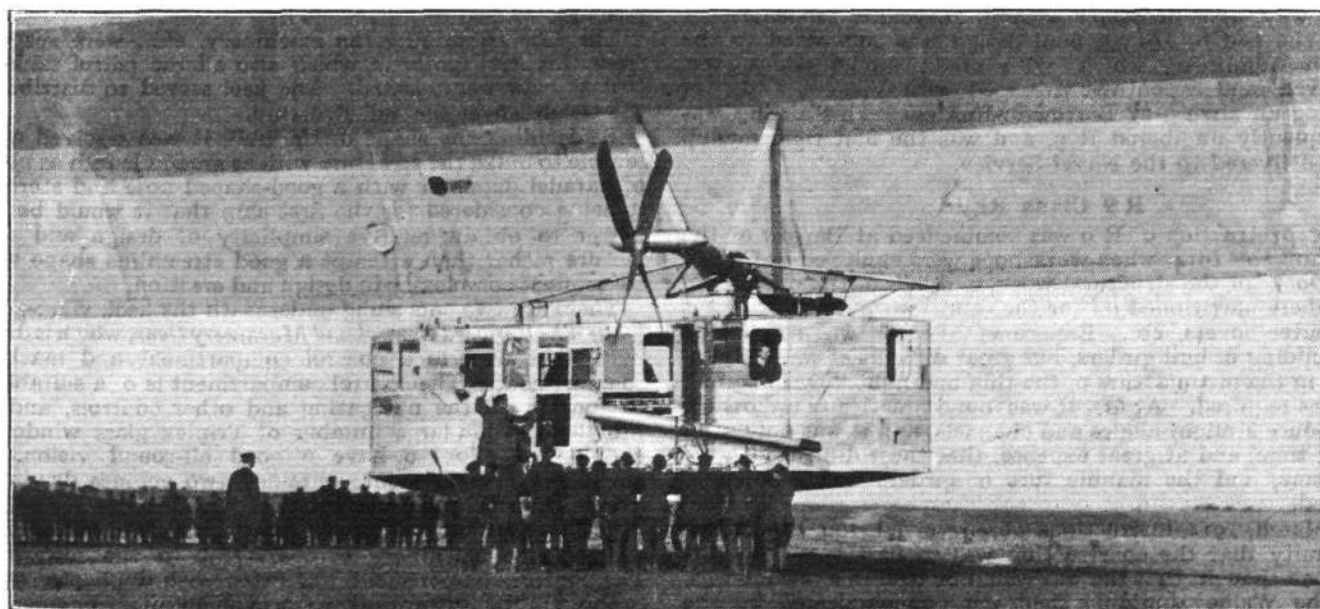
Outer Cover.—The outer cover was doped fabric, laced tightly in place, and on the upper part of the ship was covered with aluminium dust to serve as an insulator to prevent superheating of the gas by the sun's rays.

Mooring Gear.—This airship was provided with mooring gear to enable her to be moored from the ground or at sea by means of a sea anchor.

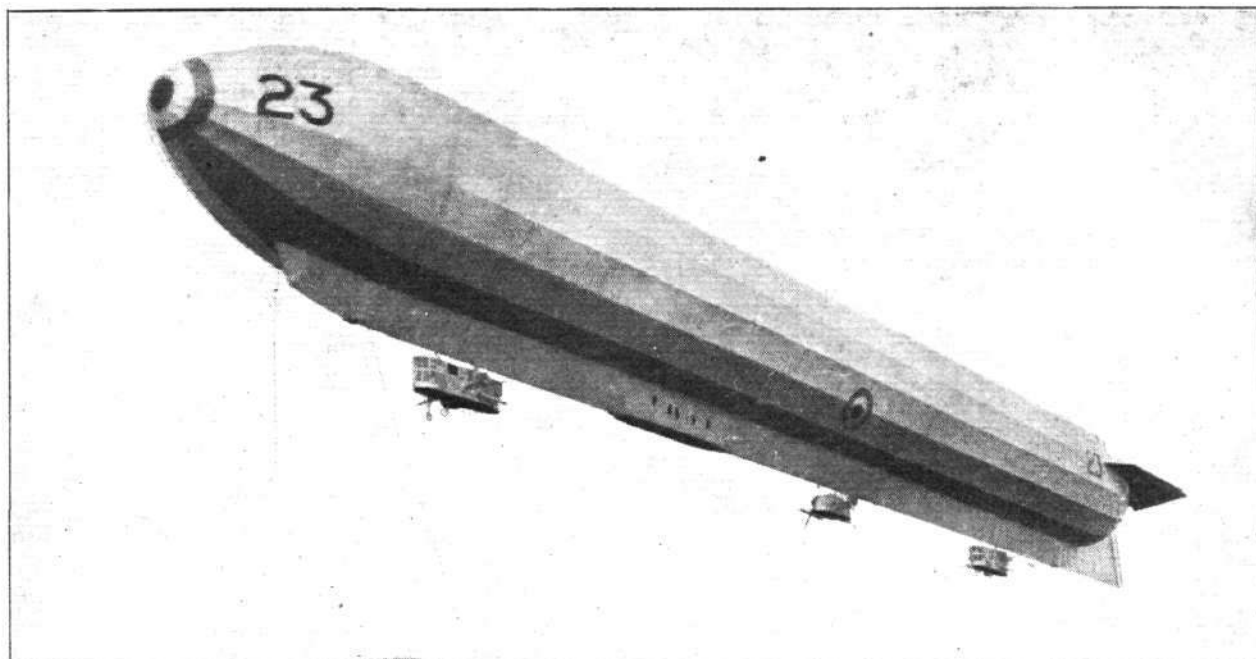
Electric Lighting.—Electric lighting supplied by current from an engine-driven dynamo was provided.

Telephones.—Telephones were fitted between all important stations on the ship.

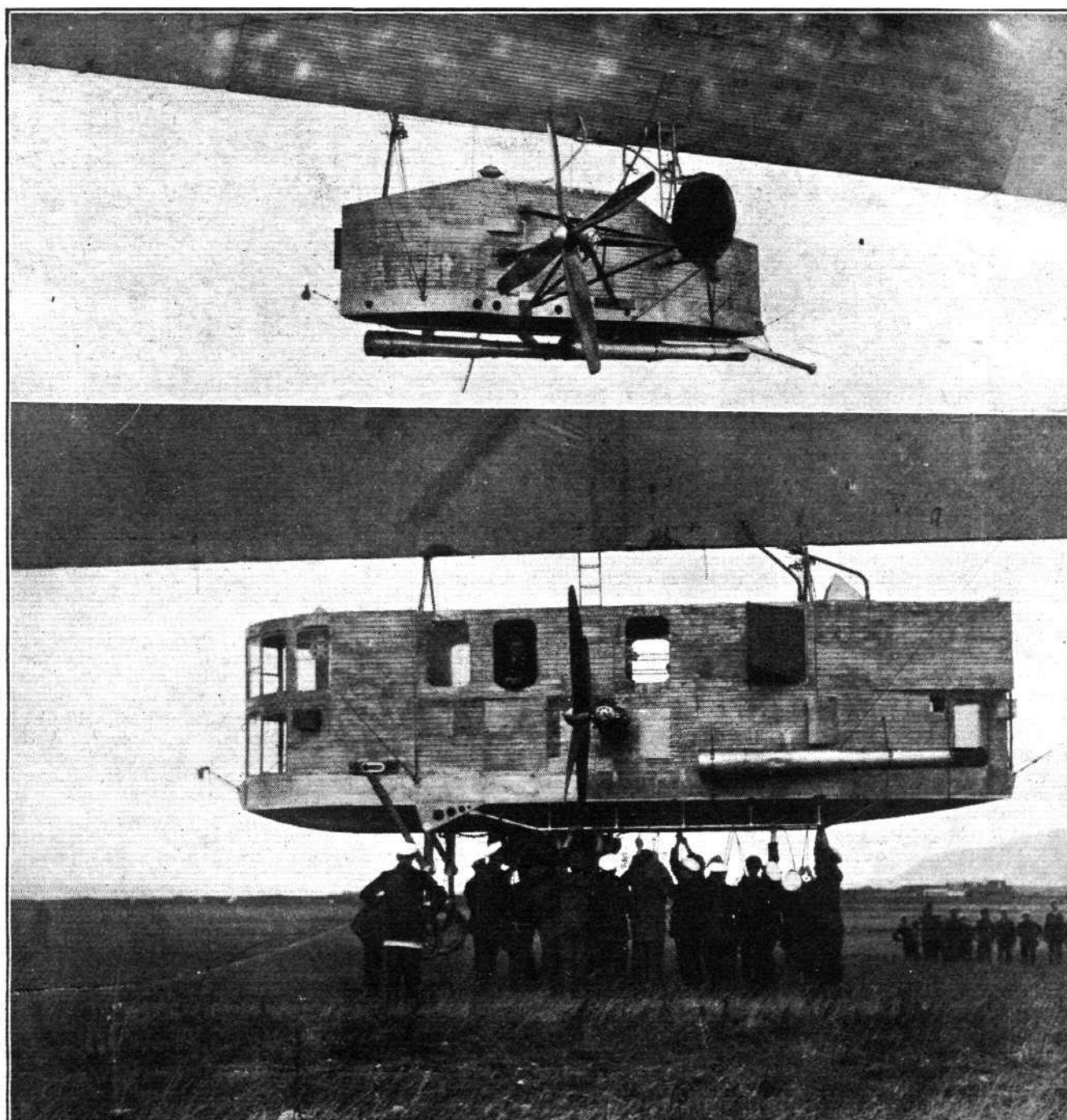
Performance Since Delivery.—This airship has given satisfaction on her acceptance trials and subsequently in service, which is particularly satisfactory in view of the fact that she is the first rigid airship designed and built in Great Britain. Since delivery she has been employed primarily in training crews for the later ships which have been built, and in this connection swivelling propellers have been found to be especially valuable in obviating bad landings. She has also carried out long patrols over the North Sea, and has been seen over London from time to time. Latterly she has been utilised for carrying out valuable experiments in connection with systems of mooring airships out both on sea and land.



The forward gondola of the "R. 9."



The "R.23," a modification of the "R.9."



The central (top) and aft (bottom) gondolas on the "R.23."

"Twenty-three" Class Rigid

When airship construction was resumed at the latter end of 1915, it was decided by the Admiralty to build rigid airships of an improved R. 9 type, and in order to develop resources for an airship construction, the Admiralty decided that Messrs. Beardmore and Co. and Messrs. Sir W. G. Armstrong, Whitworth and Co. should also take up this work, and accordingly orders for vessels were placed with Vickers, Ltd., and them.

The whole of the designs and working drawings were prepared and circulated to the other builders by Vickers, Ltd. They also placed all their experience and the knowledge derived from the costly and difficult initial experimental work entirely at the disposal of the two competitive firms starting in this industry.

Further, in order to assist the other firms to get ahead with their work, Vickers undertook to supply them with all the bracing pieces, stampings, and forgings, required for the hulls of their first ships, and also, in the case of Armstrongs, supplied them with all valves, controls, tank fittings, and other mechanical gear complete ready for the ship, together with all gasbags, outer covers, and other fabric work.

The airships of this "23" class built to Vickers' design have since commission been engaged on sea patrol work, and have taken a prominent part in the patrol of the North Sea and in convoying shipping. The two airships of this Class, Nos. R.23 and R.26 built at Barrow, were delivered in October, 1917, and March, 1918, respectively. These airships have frequently been seen over London, and R.26 took part in the surrender of the German submarines at Harwich. This ship made a record flight of 41 hours.

A forward control and machinery car with the general design as those on R.9, but improved in general construction.

One engine of 250 h.p. driving the two swivelling propellers, which, however, were carried from the car structure instead of from keel, as in R.9.

The design of these swivelling propellers embodied the Vickers' patent principle of balancing the propeller torques to facilitate control, but the detailed design was greatly improved, giving a much lighter construction.

Amidships Machinery Car.—This car contained two 250 h.p. engines carried athwart ships, each driving through a shaft and bevel gear a fixed propeller carried on outrigger brackets.

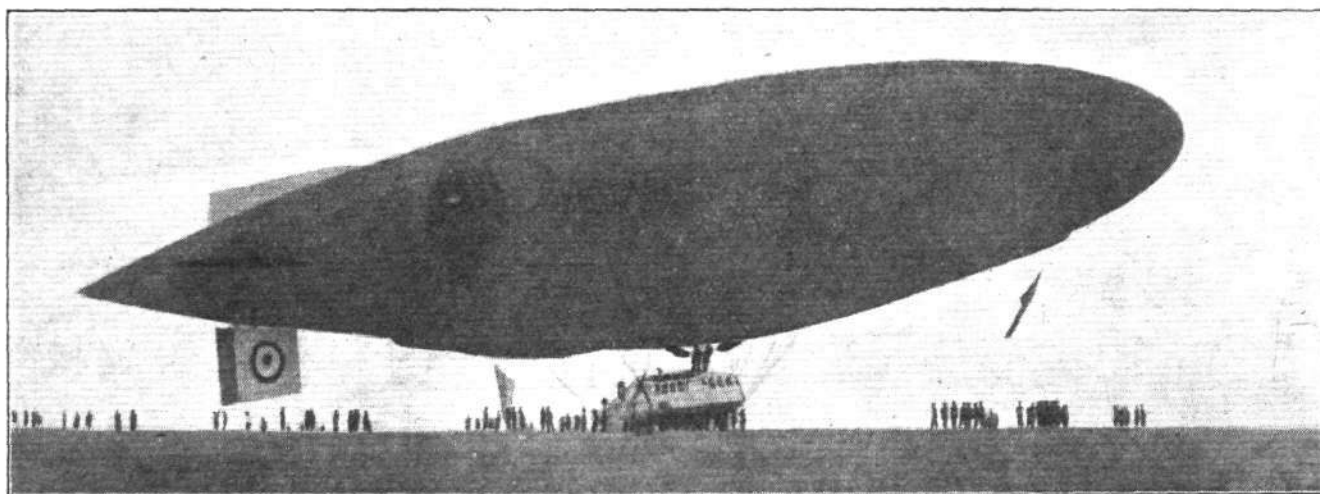
Aft Car.—The aft car was of the same general construction as the forward car, and contained auxiliary controls in the control compartment. The machinery compartment contained one 250 h.p. engine driving direct through reduction gear a two-bladed propeller mounted at the aft end of the car.

The remainder of the airship generally was in principle the same as R.9, but all details considerably improved both as regards weight and efficiency.

Performance Since Delivery.—The acceptance trial flights of those airships were very satisfactory, the speed attained being somewhat in excess to that guaranteed.

Since delivery they have been employed on the patrol of the East Coast, and the North Sea, and have served to train a number of crews for future larger rigid airships. They have also been used for carrying out various experiments on alternative methods of mooring ships out in the open, both from land and sea.

R.26, before leaving Barrow, was used to carry out a



The Vickers-Parseval-Type non-rigid.

The construction of these airships was ordered at the beginning of 1916. The Admiralty requirements were that they should be built with the greatest possible speed, and it was therefore decided that the ships should be built of an improved R.9 design, and as much as possible of the design in that ship should be adopted so as to enable the work to proceed with the least possible delay in getting out new designs.

These ships were also required to be suitable for use by inexperienced crews and therefore were required to be exceptionally strong and constructed with a strong keel backbone in the same manner as in R. 9, but it was desired as far as possible, within the limitation of time, that the design should be improved so as to give greater lifting capacity and increased speed. To attain this end, the following modifications to the R.9 design were embodied.

Whilst retaining the same dimensions and general construction of the hull, the capacity was increased from 800,000 cubic feet to 900,000 cubic feet by slightly lengthening the ship and putting a fuller shaped stern-end which enabled the increased capacity to be attained. The design of the keel, whilst being on the same principle, was greatly improved in detail, so that the same strength was attained with considerable saving of weight.

To attain the higher speed, four engines were installed, giving a total power of 1,000 b.h.p. instead of the total brake horse-power of 600 as fitted on R.9.

Swivelling propellers on an improved design were fitted on the forward car as it was still considered desirable to retain these for facilitating landing.

The arrangement of the cars is as follows:—

systematic series of trials to obtain information and data to develop a theory of the stability and controllability of rigid airships.

"Thirty-three" Class Rigid

These airships are of about 2,000,000 cubic feet capacity, and orders were placed with Vickers, Ltd., Armstrongs, and Beardmores, in November, 1916. The latter two firms having large enough sheds, were in a position to proceed immediately, but the Walney shed not being large enough, Vickers were not able to start erection until the new shed at Flookburgh near Barrow, then being designed, could be completed. They, however, proceeded with the manufacture of material and girders, etc.

When in September, 1917, the work on Flookburgh site was stopped on account of the acute shortage of steel at that time, arrangements were made for the erection of this ship to be taken over by Short Brothers of Bedford, and for the components to be made by Vickers.

All the material, therefore, that had been prepared was handed over to Short Brothers.

Vickers' R.80

R.37 having been transferred to Short Brothers, Vickers were without further work to proceed with on the completion of R.26, and Flookburgh shed and aerodrome being stopped, they were restricted to a size of airship that could be built in Walney shed.

They therefore prepared designs for an airship of the largest possible size that could be built there, and embodied in this design all the best features obtained from the German "33" Class, and also the improvements suggested by experi-

ence gained with airships of R.9 and R.23 Classes in service.

As they were given a free hand in the design without unnecessary restrictions as to strength, such as were imposed in "23" Class vessels, a design was produced which for its size was considerably more efficient than any other rigid airship, in both weight and general design.

An order for one ship to this design was placed in November, 1917, and this airship is now ready for trials.

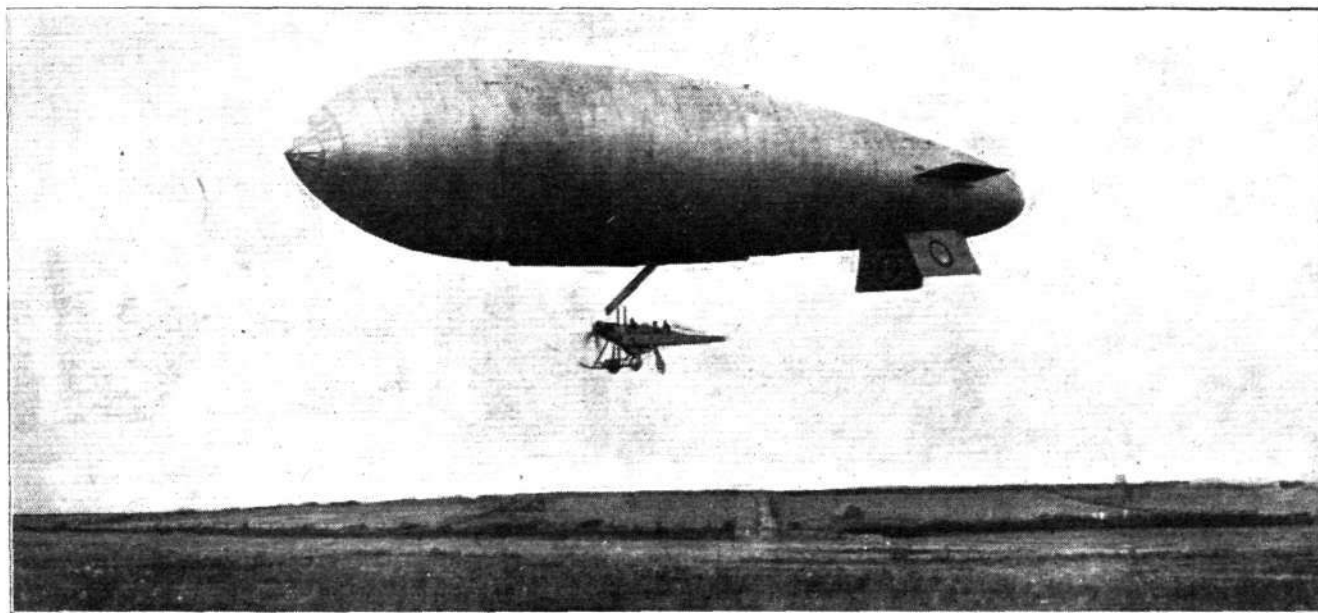
Special Features of the Design

Hull.—The shape of the hull, which is based on the results of all the best types of airships known, and also on a lengthy series of model experiments—is considered to be the most perfect known streamline shape, which therefore enables the ship to attain its speed with the least possible power. In addition to the general improvement in the design of the hull structure referred to above, many detailed improvements have also been introduced in the design of the girders, joints, and in the system of wiring. The hull is also provided with a new type of gun position carried at the aft end, and also a special gun platform on the top suited to carry heavy calibre guns. The design of these special gun positions are also covered by Vickers' patents. The hull is provided with bow mooring attachments on the Vickers' patent principle, which enables the ship to be moored out from a mooring tower in such a manner that the ship is free to turn in any direction

The wing cars each contain one engine driving direct a propeller at the aft end and at engine speed without reduction gear. Reverse gear is fitted to these propeller drives for use when the ship is landing.

The most careful consideration has been given to the design of the cars and by making them of a perfect streamline shape, the head resistance is cut down to a minimum whilst at the same time the engineer crew are provided with a degree of comfort and convenience which has not hitherto been attained. The structural system on which the cars are designed also enables the weight to be cut down to a minimum whilst giving greater strength and rigidity of structure than the usual design. A special type of buffer bag and buoyant covering is fitted to the forward car and also to each of the machinery cars. These buffer bags are of such a nature as to enable the airship to float on the water and also gives considerable cushion effect to absorb the bump when landing on the ground. The nose of the car is also so arranged with windows as to give exceptionally good all-round vision for the navigating officers.

Machinery Installation.—This airship is fitted with four "Wolseley-Maybach" engines of 240 h.p. each. This design is developed from the German "Maybach" engine, of which Vickers', Ltd., obtained the manufacturing rights before the War. This engine has been specially developed for airship work, and gives a high degree of reliability and a very low petrol consumption which, together with the capability



The Vickers "S.S." type non-rigid ("Blimp").

and lie with the wind, thus enabling her to be moored out in safety even under the most severe weather conditions.

Gasbags.—The gasbags in this airship are made under a new system patented by Vickers', Ltd., which enables them to be constructed of the lightest possible weight, whilst at the same time giving extremely good gas holding properties.

Controls.—Special consideration has been given to the design of all control gear for steering and controlling gas discharge, etc., and the results of over five years' experience in design and working has been taken advantage of in R.80 designs, the most important feature of which is that all controls are carried from the car to the hull in an accessible shaft which gives them complete protection from the weather whilst enabling all parts of the control gear to be accessible during flight, a feature which has not been evident in any of the other airships yet built.

Cars.—Four cars are attached to the hull, viz.:—

(a) *Forward control car and machinery car*, which are flexibly connected together to form one streamline body.

(b) *Two wing cars* for machinery only, attached on opposite sides of the airship.

The control car is of sufficient size to contain all the navigating controls and instruments and the navigating crew, with provision to give sufficient room and convenience for their comfort. The wireless cabin is also fitted in this car.

The forward machinery car carries two engines arranged *en echelon* driving one direct driven propeller at the aft end. The driving gear is so arranged as to enable the propeller to be driven either by one or both of the engines.

of running continuously for long periods, are the essential characteristics for airship propulsion.

The transmission machinery designed by Vickers', Ltd., has been based on the experience in previous airships, and gives the best possible performance consistent with absolute security from failure and breakdowns. The gears have been designed on the results of a long series of experiments on the strength and endurance of gear teeth running under the conditions prevailing in an airship.

Many other improved features in the machinery installation have been embodied in this airship.

Non-rigid Airships, P.6 and P.7 (Parseval Type)

In 1914, when the Admiralty decided to put in hand a programme of airships for the British Navy, it was decided to obtain large non-rigid airships of 360,000 cubic feet capacity and after consideration of the various types of non-rigid ships then in use, the "Parseval" type was adopted as being suitable, and orders were placed in October, 1913, with Vickers', Ltd.—who held the British patents for the "Parseval" envelope—for airships of this type. The first of these airships, P.5, was to be built by the "Parseval" Co. at Ritterfeld, Germany, and flown over to England. The others were to be built by Vickers', Ltd., at Barrow. Owing to no facilities being available in this country to manufacture non-rigid envelopes of this size, it was decided that the first envelopes should be made by the Parseval Co., and that spare envelopes should be made by Vickers', Ltd., as soon as their fabric factory was in working order. The design of

these airships was based on that of previous ships built by the Parseval Co., but with radical alterations to suit the requirements of the Admiralty. The most important of these were the following:

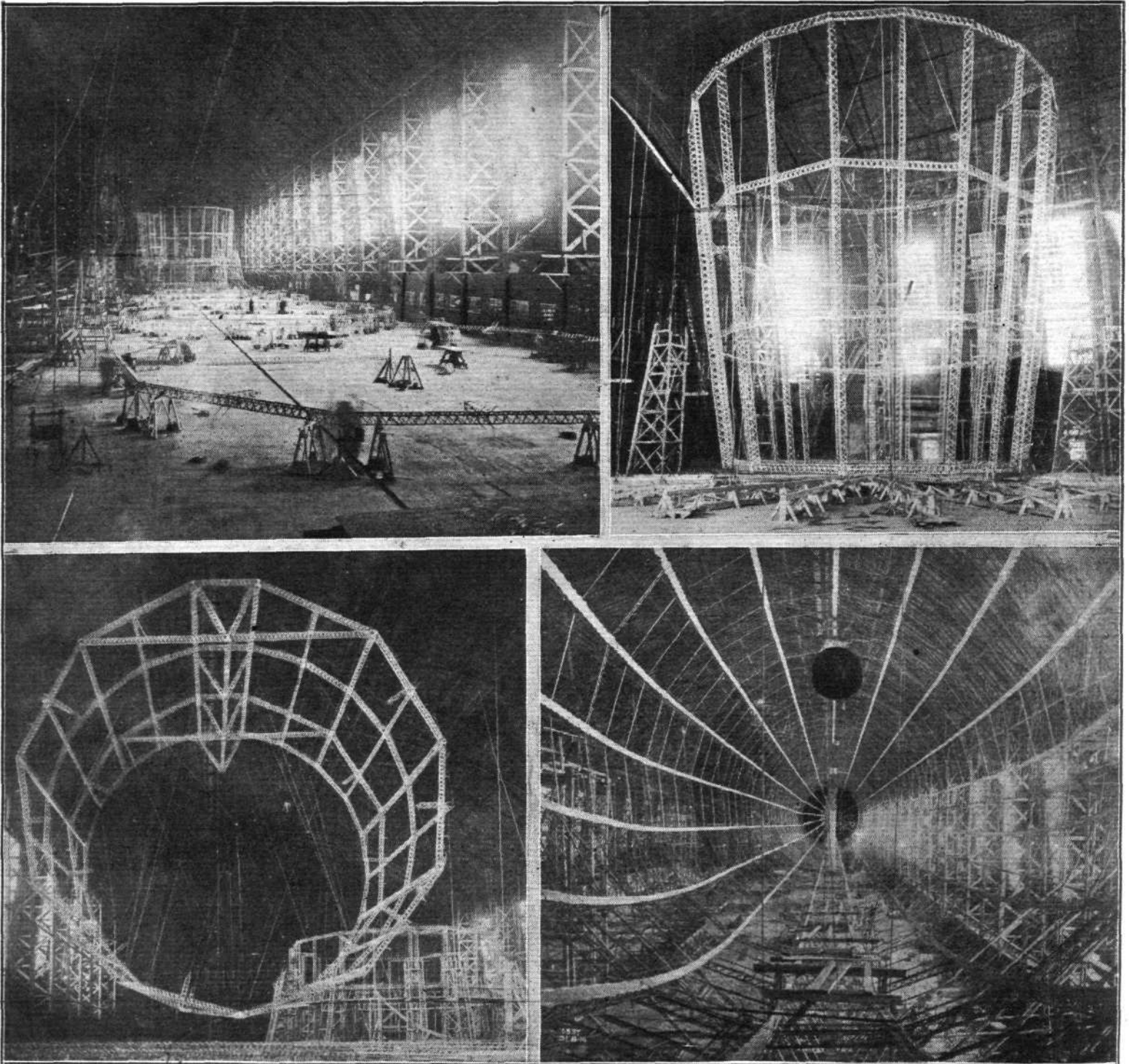
Swivelling propellers were to be fitted to facilitate handling and landing of these ships by inexperienced pilots, and the cars were to be specially designed of a very robust construction to enable them to stand heavy landings on the ground, and also were to be fitted with a watertight double bottom to enable them to land on the sea.

The shape of the envelope was greatly improved from that of previous "Parseval" airships as the result of a series of model experiments carried out by the Parseval Co. at Göttingen, Germany. The system of weight distribution to the envelopes was a new system recently brought out and patented by the Parseval Co. In this the car was hung from a relatively small suspension gurt on the underside of the envelope from which the weight was distributed over the

whole surface of the envelope by means of a system of "trajectory" bands, beyond serving to distribute the weight and reducing the bending moment in the envelope with a consequent reduction in the inflation pressure required, also considerably strengthened the fabric to resist tearing, etc. The nose was re-inforced by a series of steel tubes to prevent it being pushed in by the air pressure when flown at full speed.

The ballonets were provided, of a total capacity of 30 per cent. of the gross value of the envelope, and an air pressure of 25 m/m in these served to keep the envelope in perfect shape. With the ballonets of this size, the ships were enabled to rise to a height of 10,000 feet. The envelope was provided with the usual gas valves, ripping panels, and other fittings, and was also fitted with a gun platform on the top of the envelope reached by an access tube through the envelope.

The car was a very strong and rigid structure built with a "Duralumin" framework and plating. It was constructed



Four views showing the progress in the construction of a Vickers rigid. Reading from left to right, at the top the transverse frames being assembled on the floor, and a completed section of hull in vertical position. Bottom, a completed section lifted and turned over ready for laying on the erecting cradle, and view looking down inside the completed hull structure.

with a watertight bottom to enable it to land on the water, and with a very strong substructure construction to enable heavy landings to be effected without damage.

The body of the car was divided into two compartments, viz. :—

(a) The control compartment, in which were fitted all the navigating controls and a small wireless cabin; and

(b) The machinery compartment, in which were fitted two "Maybach" engines of 160 brake horse-power each, together with auxiliary machinery.

Petrol and oil were carried in aluminium tanks carried inside the car substructure where also the ballast was carried in fabric bags.

The two "Maybach" engines of 180 h.p. each were fitted side by side in the machinery compartment driving the over-head swivelling propellers through bevel gears and vertical shafts. The two propellers were arranged to swivel together with hand control from the control compartment. An air blower to inflate the ballonets was fitted in the machinery compartment and arranged to be driven alternatively from the main engines or by small auxiliary engine which was fitted. This auxiliary engine also drove the lighting dynamo.

The envelope was provided with the usual mooring ropes and handling lines.

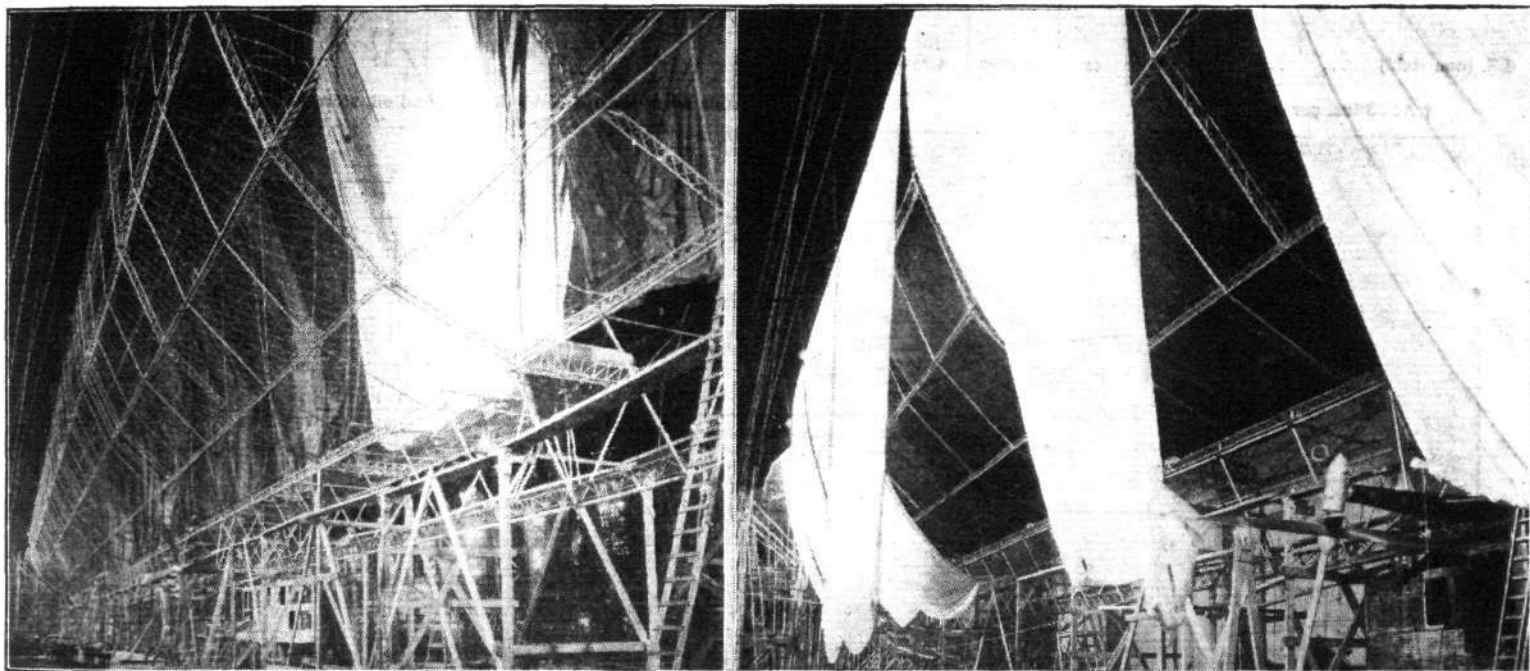
Envelopes for Non-rigid Airships.—A number of envelopes of various types and sizes for non-rigid airships have been made at Barrow and Douglas, Isle of Man.

Considerable assistance was given to the British Admiralty when they launched their programme for S.S. and C.P. airships. For instance, in the case of the C.P. ships which had "Astra-Torres" envelopes, sets of templates were made which were distributed to other competing firms to enable them to manufacture.

Gasbags for Rigid Airships.—The gasbags for nearly all the rigid airships of "23" Class were made at the Douglas factory, and large numbers of other gasbags have been made for other Admiralty airships built by other firms, as well as the airships built by Vickers', Ltd.

Experimental Work Carried on by Vickers', Ltd., in Connection with the Mooring of Airships.

The question of mooring aircraft in the open without the protection afforded by sheds or screens has occupied the attention of airship pilots and designers ever since the time when it was realised that lighter-than-air aircraft had a practical future before them. Numerous experiments have been carried out in the past with varying degrees of success, and while it is not the purpose of the present note to refer



THE VICKERS RIGID AIRSHIPS : On the left, gasbags being inflated in position, and on the right the outer covering being attached to hull.

Performance After Delivery.—These two airships were used for coast patrol work on the East Coast and carried out a great number of night cruises.

Non-rigid S.S. Type Airships

These small airships were of the same general type as the early British Sea Scout airships.

The envelopes are of a streamline shape and the cars are suspended by flexible wire ropes attached to suspension patches suitably distributed over the envelope. The latter are provided with the usual gas valves, ripping panels, and other fittings.

Car.—The car was a standard B.E. type aeroplane chassis without the wings, etc., and was fitted with a single engine of 80 brake horse-power driving a tractor screw.

The ballonets were kept inflated by the air stream from the propeller which was intercepted by a scoop pipe suspended from the envelope.

Performance After Delivery.—It is understood that these small airships have been employed for anti-submarine patrol in the Mediterranean.

Other Airship Work

Kite Balloons.—Some of the earliest kite balloons made in England were made at Barrow, and a subsequent contract was obtained for 26.

to these in detail, it is worthy of remark that Vickers', Ltd., acting in conjunction with the Admiralty, were the pioneers of mooring for rigid airships as far back as the year 1911, when H.M.A. No. 1 was moored out on the water for three days to a floating mast in Cavendish Dock, Barrow-in-Furness.

No further experiments were carried out until quite recent times when the problem of housing non-rigid airships of the "Sea Scout" type became acute owing to the fact that the number of ships required for sea patrol duties actually exceeded the number of sheds which could be erected for their accommodation.

At the end of 1917, therefore, Messrs. Vickers were invited to co-operate with the Admiralty in the endeavour to find a successful solution to the problem, and eventually orders were given for the design and construction of two mooring stations. The first of these comprised a method suggested by Vickers', whilst the second embodied the ideas of Brig.-Gen. Masterman, R.A.F.

Proposal one was completed, and a ship put out for trial in March, 1918. Although this experiment was not completely successful, much useful information was gained, full advantage of which was taken in completing the station for proposal two.

Proposal two was completed, and a ship put out for trial

in May, 1918. The scheme proved at once to be an even greater success than the most sanguine had hoped for. The experiment was subsequently transferred to an air station, where a succession of ships have been moored out almost continuously to the mast built by Vickers', Ltd., from June, 1918, to the present date. The degree of success obtained may be gauged from the fact that these ships have encountered, without accident of any kind, all varieties of summer and winter weather, including the wind velocities up to 55 m.p.h. during the autumn, and a severe snowstorm during the past winter months.

In view of their unique experience in the mooring of aircraft, a request was made early in 1918 that the firm would put forward proposals for the application of mooring to the

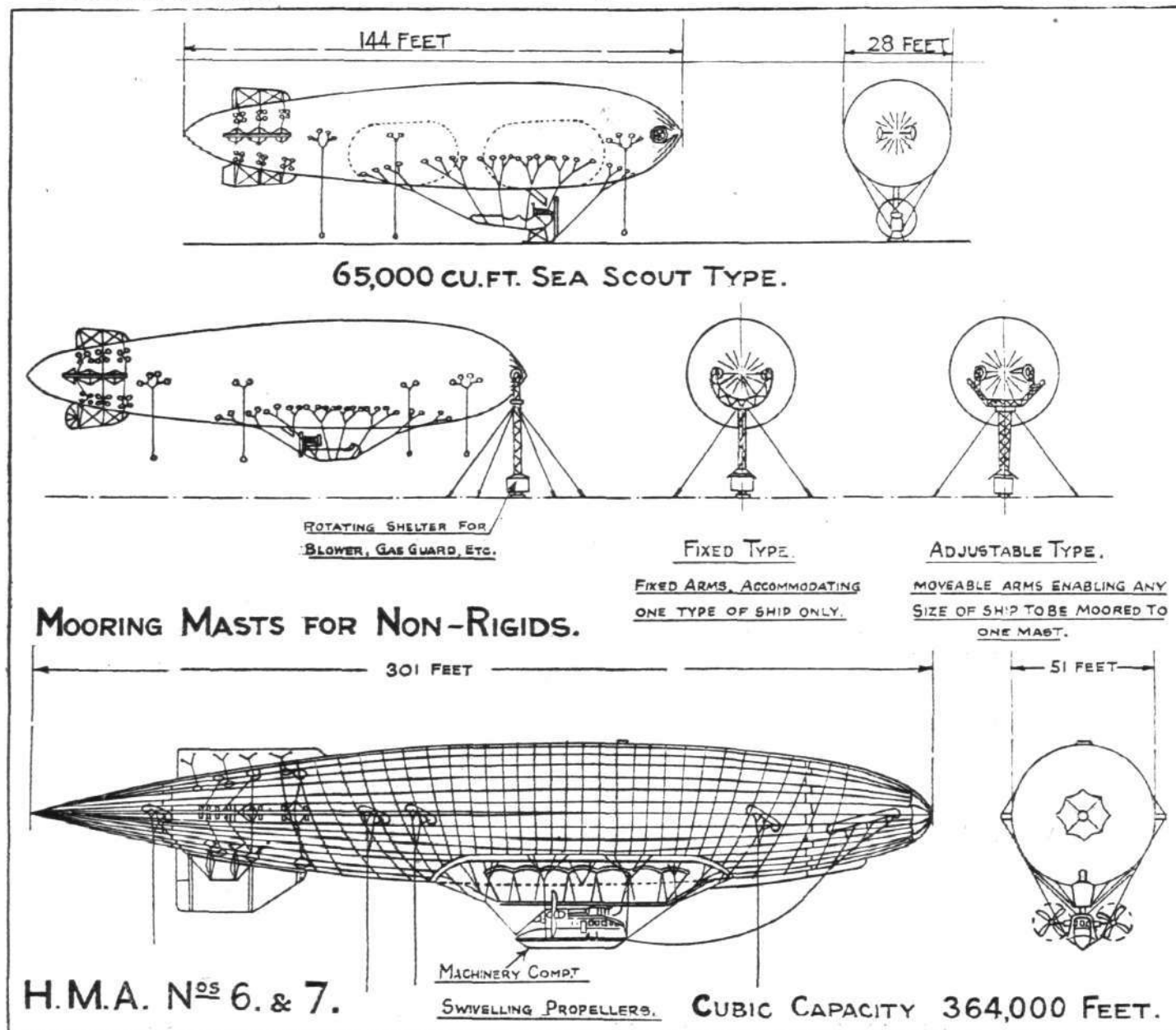
largest type of rigid airships. After a considerable amount of preliminary investigation, a scheme was produced which not only provided for the mooring of the ships, but also enabled them to be landed at the mast, or released for flight, entirely by mechanical means, thus obviating the handling party of 300 to 400 men previously required to carry out these operations. This scheme, worked out in conjunction with Admiralty officers, was submitted to the Admiralty in March, 1918, and received immediate approval as being the most promising proposition hitherto put forward in this connection.

An order was accordingly placed with the firm, and a ship selected for the necessary adaptation to carry the mooring appliances.

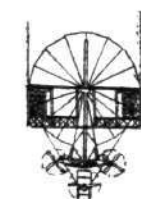
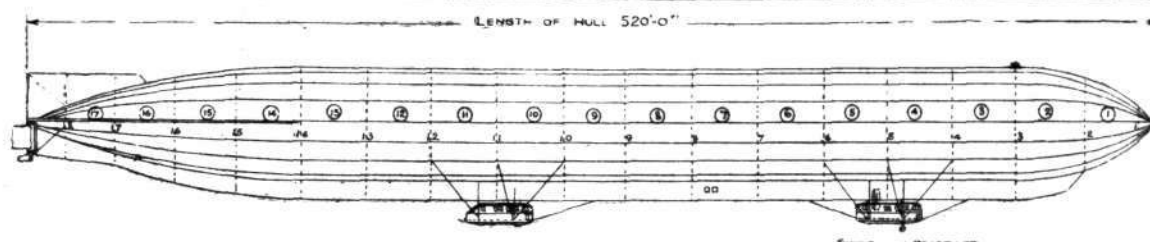
Type and date delivered.	Length.	Width.	Height.	Gross Gas capacity.	Gross total lift.†	Disposable lift.‡	Total max. h.p.	Make of engines.	Speed.			Endurance.			Crew carried.
									Full power.	Normal power. (½)	Cruising power. (⅓)	Full power.	Normal power. (½)	Cruising power. (⅓)	
R.9 (rigid), March, 1917 ..	520	53	76	800,000	Tons. 24	Tons. 5.2	600	Wolseley-Maybach.	m.p.h. 45	m.p.h. 38	m.p.h. 32	hrs. 18 (500 miles)	hrs. 26 (1,000 miles)	hrs. 50 (1,600 miles)	14
R.23 (Sept., 1917) } Rigid	535	53	75	900,000	27	6.3	1,000	Rolls-Royce.	55	48	38	18 (1,000 miles).	26 (1,250 miles).	50 (1,900 miles).	—
R.26 (April, 1918) }															
R.80 (rigid)	535	70	85	..	..	..	..	..	..	..	..	..	..	..	..
P.6 (Aug., 1917) { Non-	312	57	70	360,000	11	3.1	360	Maybach.	42.5	36	28	24 (1,000 miles).	36 (1,300 miles).	70 (1,950 miles).	—
P.7 (Mar., 1918) { rigid }															
S.S. (non-rigid)	140	32	45	70,000	lbs. 4,750	lbs. 1,800	80	..	45	..	35	(800 miles).		(1,000 miles).	2

† At 68 lbs. per 1,000 cub. ft.

‡ Disposable lift is that available for fuel and oil, stores, crew, and passengers.



THE VICKERS NON-RIGID AIRSHIPS: General arrangement drawings of S.S. and Parseval type ships, and mooring mast.



END VIEW
LOOKING FORWARD

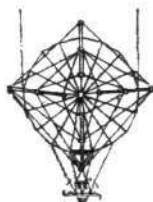
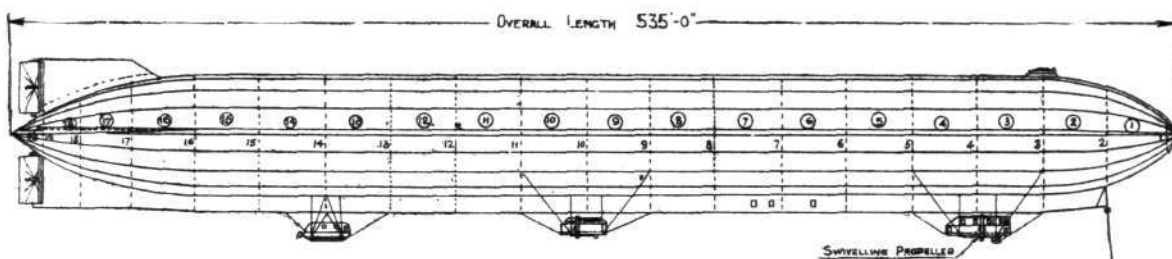


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SECTION IN WAY OF FORWARD CAR.
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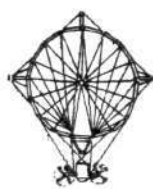
H. M. A. R. 9.



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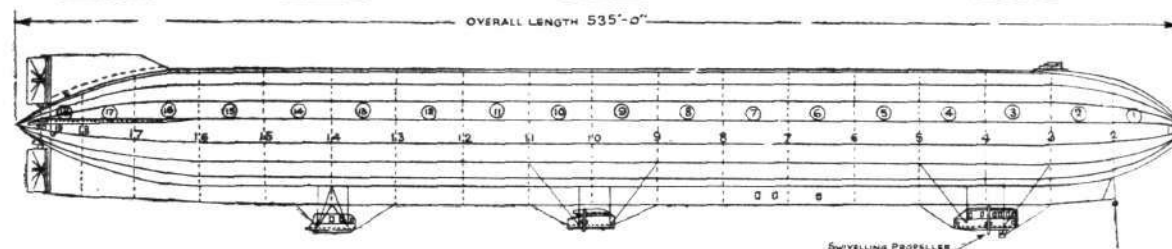


SECTION IN WAY OF CENTRE CAR.
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SECTION IN WAY OF FORWARD CAR.
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H. M. A. R. 23.



END VIEW
LOOKING FORWARD



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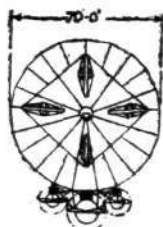
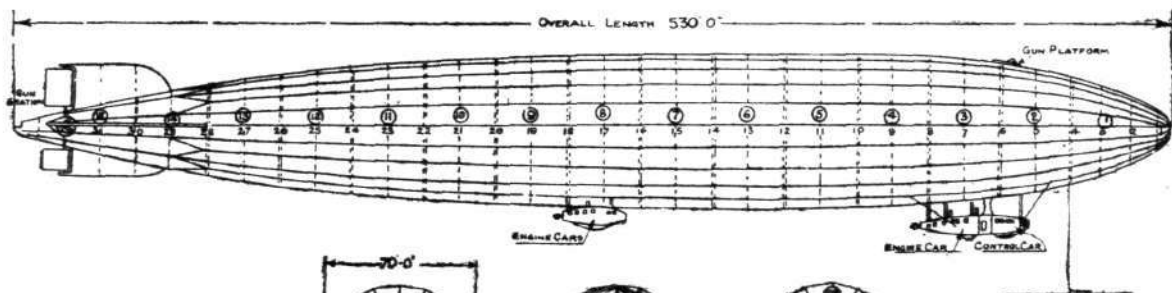


SECTION IN WAY OF CENTRE CAR.
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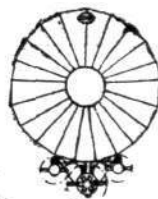
H. M. A. R. 26.



END VIEW LOOKING FORWARD.



SECTION IN WAY OF MAIN FRAMES.



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H. M. A. R. 80.

LONDON-PARIS AIR SERVICE

MONDAY next is to see the inauguration of the first regular daily international air service. It will be between London and Paris, the "port" at this end being Hounslow, while Le Bourget, near Paris, will be the French station. The service will be run by Aircraft Transport and Travel, Ltd., the machines being of the Airco 4A and Airco 16 types, fitted with Rolls-Royce engines. The 4A type will carry two passengers. Comfortable seats with tables are provided, and there is a certain amount of room available for baggage. They will be covered in from the wind, and passengers can travel in their ordinary clothes, and read and write, play cards, or do business on the way over.

The machines will start from each end, each day at midday, weather permitting, and it is anticipated that the journey will take about 2½ hours. The American Express Co., 6, Haymarket, S.W. 1, have been appointed booking agents, and arrangements will probably be made to convey passengers from their office to the aerodrome, and similarly motor cars will take passengers from the French aerodrome to Paris.

Sir H. Trenchard Promoted

It was announced by the Air Ministry on August 19:—"H.M. the King has been pleased to approve the promotion of Air Vice-Marshal Sir H. Trenchard, K.C.B., to Air-Marshal, with effect from August 11, 1919."

The Royal Aeronautical Society

It is announced by the Royal Aeronautical Society that H.R.H. the Prince of Wales has been graciously pleased to signify that he will act as patron of the Society.

Brig.-General R. K. Bagnall Wild, C.M.G., R.E., has been elected Chairman of the Society for the ensuing year. A branch of the Society, with Sir William Beardmore as Chairman, has been formed at Glasgow. Mr. J. Buyers Black is the Hon. Secretary, and the offices are at 4, Jane Street, Blythswood Square, Glasgow.

Relinquishment of Landing Grounds by R.A.F.

THE Air Ministry announces that the following stations and landing grounds have been relinquished by the R.A.F.:

Stations	
Torquay (seaplane).	Tipnor (kite balloon base).
New Romney.	Sheerness (kite balloon base).
Seaton Carew (seaplane).	
Landing Grounds	
Lower Beeding	Sussex.
Earnley	Sussex.
Kingshill (West Malling)	Kent.
Blackneath (Colchester)	Essex.
Plungar	Nottinghamshire.
South Cave	Yorkshire.
Bishopston	Durham.
Cairncross	Berwickshire.
Burnham-on-Crouch	Essex.
Broomfield (Chelmsford)	Essex.
Appleton Wiske	Yorkshire.
Ponteland	Northumberland.
New Chapel	Surrey.

Weather Experts' Conference

ARRANGEMENTS have been made to hold a conference of representatives of the Meteorological Services of the British Dominions in London from September 23 to 27.

Information has been received that the following official meteorologists of the Dominions beyond the seas will be present:—

Capt. A. J. Bamford, Director of the Meteorological Service of Ceylon; The Rev. D. C. Bates, Director of the Meteorological Office of New Zealand; Mr. H. A. Hunt, Director of the Weather Bureau of the Commonwealth of Australia, Melbourne; Mr. H. Knox Shaw, Director of the Meteorological Service of the Public Works Ministry, Egypt; Mr. C. Stewart, Chief Meteorologist of the Union of South Africa; Sir Frederick Stupart, F.R.C.S., Director of the Meteorological Service of Canada; Dr. G. T. Walker, C.S.I., F.R.S., Director-General of Indian Observatories.

The subjects to be considered will include:—

(1) The meteorological arrangements for the exchange of observations by wireless at comparatively long distances. Specification of observations for the surface and the upper air, with the codes for transmission; (2) The consideration of instruments and material for the investigation of the upper air; (3) The selection of stations of the Réseau Mondial for the purpose of the general climatology of the globe. (See Réseau Mondial 1911-12-13, M.O. publication 207 g., 214 g.);

The fare for the single journey will be twenty guineas. Parcels will also be conveyed by the service, and they can be delivered either at the Hendon aerodrome by 11 o'clock in the morning, or at the depôts to be established in the City, where they will be collected daily. The rates will be 7s. 6d. per lb., with a sliding scale down to 3s. 6d. per lb. for parcels weighing more than 1 lb.

The pilots chosen for the service include Major Patteson, M.C., A.F.C., who was the first to organise the route to Paris for the Air Ministry last year, and who brought Marshal Foch to this country; and Captain Gathergood, A.F.C., an experimental air pilot engaged by the Air Ministry, who won the Aerial Derby round London a short time ago. All the others are pilots of experience.

In addition to this daily service it is proposed to run a weekly service of Farman "Goliath" machines, each carrying twelve passengers. They would fly from Paris to London on Thursdays and return on Fridays. In the event of this arrangement proving popular the service may be extended.

(4) The provision of current meteorological information for the main air routes of the world; cooperation in the investigation of the meteorological conditions of aerial navigation; (5) The Trade Routes and the meteorological survey of the oceans by observations transmitted by radio-telegraphy from ships.

Cross-Country Races from Hendon

It has now been decided to postpone the Hendon-Brighton-Hendon race, which was provisionally fixed for August 30, until later in the season, and the Hendon-Manchester-Hendon race, fixed for September 20, has also been put off. It is possible that the "Pratt's" Trophy and prizes may be devoted to an international race and reliability trial for commercial machines over a course from Hendon to Paris and back. This competition would take the place of the Hendon-Manchester race.

The Irish Aerial Derby

IN connection with this event, some details of which were given in our last issue, we now learn that the fastest time for the course of 102½ miles was made by Lieut. W. A. Roberts, who was eventually placed third on the handicap. His time was one hour and six minutes, representing an average speed of 92.8 miles per hour. His mount was an Avro, fitted with a 130 h.p. Clerget. Avros secured first, second, third, fourth and fifth places in the race.

London to Copenhagen

ON Monday morning a large Handley Page, piloted by Major Tryggve Gran, arrived at Copenhagen, having flown across from London. The machine left Cricklewood on Sunday at 9 a.m. and crossed to Holland, and a brief call was made at the Soesterberg aerodrome. It then went across Holstein to the Baltic, when, owing to contrary winds, it landed at Bagenkop, South Langeland. The next morning it went on and landed on the Island of Amager, south of Copenhagen. There were seven passengers on board, including Mrs. Gran, Capt. Steward, and Capt. Meisterlin. It is intended to continue the trip to Christiania and Stockholm.

The Avro Baby at Amsterdam

THE Avro "Baby" which won the sealed Handicap at the Aerial Derby in June is now on view at the E.L.T.A. Exhibition at Amsterdam. She was piloted across last week by Captain Hamersley. The stage from Hounslow to Brussels was made in 2 hrs. 50 min., which speaks well for the 35 h.p. Green engine with which this machine is fitted.

Kent Air Stations

ADMIRAL SIR DOVETON STURDEE, Commander-in-Chief at the Nore, with the approval of the Air Ministry, has cancelled the orders issued by him in March, 1918, under the Defence of the Realm Regulations, prohibiting approach to the air stations at the Isle of Grain, Eastchurch, Leysdown, Manston, and Westgate and the Kite Balloon Station at Sheerness.

Kronstadt Again Bombed

BRITISH aeroplanes again bombarded Kronstadt on August 13, hits being observed on the forts, and a benzine depôt is believed to have been set on fire, while a wide area of the town is said to have been destroyed.

The Finnish General Staff reports that two British aeroplanes crashed at Koivisto or Kaviskaia, but the casualties are not reported.

AVIATION IN PARLIAMENT

Air Ministry Contracts

In the debate on the Consolidated Fund Bill, on August 12, the Under-Secretary of State for Air (Major-Gen. Seely) said:—It may be for the convenience of the House if I make a statement on certain points on which I promised to give the House information, notably with regard to the reduction in expenditure of the Air Ministry, and also with regard to certain specific complaints. I do not propose to deal with the questions raised yesterday with regard to Sir John Hunter, for I have nothing to add to or to subtract from what I then said with regard to my responsibility in that matter, which will be dealt with by my right hon. friend the Lord Advocate at a later stage. With regard to the other matters, the House will remember that when I was appointed to my present office I was enjoined to preside over the Council and to be responsible for all the business of the Council.

Therefore, I could not disclaim responsibility for what is happening now, even if I wished to do so, which I certainly do not. I do not propose to deal with any of the pre-war contracts or war contracts. I was away from the House, and, indeed, from this country, at the time. All that can be dealt with better by those who have knowledge of the facts. What I think the House will want to know is, is extravagance going on now, and if it is, why it is not checked, and are those who are responsible for such extravagance being properly punished? I propose to deal with that to-day in as short a time as possible. First, as to the charge of general extravagance levelled against the Air Ministry, let me say, although the point has not often been raised in this House, it is constantly raised outside, that we are extravagant in that we put up estimates of £66,000,000. I stated to the House in the most explicit terms when I introduced the Air Estimates that a great proportion of that £66,000,000 was due to the finishing up of war contracts. It has been said again and again that the £66,000,000 has no relation whatever to the ordinary Estimates for the Ministry. When it is reflected that at the time of the Armistice we had more than 250,000 men, and we had arrangements to produce 50,000 aeroplanes per year, it is apparent that when the war stopped suddenly on November 11 you could not wash out the whole of that gigantic expenditure all in a moment. This £66,000,000—and I know every member of this House knows this, though it is not sufficiently realised outside—is the charge which we have to bear, not for maintaining a normal Air Force—that is only a portion of it—but owing to gigantic expenditure due to the great war, in which the Air Force cost a great deal of money and in which, I venture to say without fear of contradiction, it contributed in large degree to the victory that we won.

What have we done to reduce since the Armistice? At the date of the Armistice there were 30,000 officers; to-day we have demobilised 20,000 of those, so that is 20,000 out of 30,000. Of other ranks, including cadets, we had 264,000 at the date of the Armistice; we have demobilised 203,000 of those. So rapid a reduction in any force I should think there has never been, certainly in the history of this country. Of aerodromes and landing grounds we had, at the date of the Armistice, 386, of which we have given up 210. On that I may say, in passing, that the giving up of this large number makes it much more difficult for the airmen to find suitable landing grounds in some parts of the country. I would like here publicly to acknowledge the great assistance rendered to me and the Air Ministry by the lord-lieutenants of counties and the chairmen of county councils and others who are arranging emergency landing grounds to fill the gaps. To return to the reductions, the staff of the Ministry in all departments at the date of the Armistice was 806. Although we have great responsibilities, as I will presently show, that number is now reduced to 402—that is, reduced by half. Of hired premises and hotels, we had at that time the enormous number of 2,143, of which 1,927 have been given up and 37 more are in process of being given up. I claim, taking the figures I have given, and I do not think they can be challenged, that so great an economy in a public service has never been made in the same time.

As to the number of the Women's Royal Air Force, I cannot give the exact figure at the moment, but I can give the approximate number. They have been reduced by not quite half, but they are going to be reduced much more, to about 3,000, including all the work of domestic service, for which women are more suitable than men, whether disabled or otherwise. That is in process of being done. It will be apparent to the House, with this extraordinarily rapid reduction from 264,000 to 60,000 in a few months, that you want a large staff of clerical people to deal with that demobilisation. I have shown the great economies that we have made, but on general charges of extravagance all that I ask is that specific cases shall be shown. I cannot get specific cases. People say, "The workmen are not doing a full day's work." I deeply regret that if it is so, but that is not under the control of the Air Ministry. The statement that the labourers are not doing a full day's work is a wrong criticism to charge to the Air Ministry. It has nothing to do with the Air Ministry as such. It is general war weariness, which is found in all walks of life. I want specific cases. No doubt the House will remember that three—I think only three—specific cases have been ventilated in the House and in the Press, and I propose to deal with those three. The first was the statement in a letter to *The Times* that aeroplanes were being recklessly destroyed, and that the most horrible waste was being committed at Farnborough, and that comment raged throughout the length and breadth of the land, that we were burning aeroplanes and taking no steps to save money. One can speak best of what one has seen oneself. I went down there, and I can assure the House that, being familiar with salvage dumps, I have never seen so well-organised a business as what is going on at Farnborough now, and what was going on then. Far from it being reckless destruction and haphazard burning, the officer in charge was a man who had made a speciality of salvage work, and had earned the thanks of his superior officers in France owing to his great skill and the saving of millions of money to the public by his salvage. He has organised the thing to such a pitch that not one penny piece is lost. I invite any hon. gentleman who has the time to go and look at it. Here we have this vast number of aeroplanes beyond requirements. It has been said by my right hon. friend the member for the City of London's Committee that it might be cheaper to burn the aeroplanes. Indeed, I am not sure that it would not be; but it would be a very bad example. We are trying our very best to get what value we can at Farnborough. This most expert young officer, with a staff of men who know the job, are taking out each particular little bit of the aeroplane that can be sold, putting it aside in its appropriate box, selling it to those who will purchase to the best advantage and making a business which he assures me does just pay. I am not sure that it will be found, when the full accounts are made up, that it does pay to go through this elaborate business, but at least we have saved tens of thousands, probably hundreds of thousands of pounds, by the meticulous care shown by these people at Farnborough in the difficult art of breaking up an aeroplane and saving the parts that are the most valuable, putting them in places where they can be put up to action, and generally making a wise economy in every direction.

The next case is a small one; but if I deal with small cases it is because I cannot get hold of big ones. It is the cost of Air Ministry cars. My right hon. friend's Committee investigated the question of the cost of the Air Ministry cars. The question of how many there should be is another matter. In point of fact, there were 68; there are now 22. There were 33 of what are called allotted cars, for officers going to particular places; there are now

only six. The number is reduced, as will be seen, to one-third in the one case and to one-fifth in the other.

My right hon. friend asked for the cost of these motor cars. I have here the document that was presented to me. It deals with the R.A.F. Transport, London District, and gives the number of vehicles, with a statement of what these vehicles are doing. Most of them are clearing up—for example, the Cadet Distribution, Hampstead; the Technical Department, R.A.F., Stores; and so forth. There were about 40 or 50 cars at the Air Ministry at that date. Turning over the page, in order to see what the cost was we find that the cost per week worked out at £2,000. Now comes the mistake, which would be comic if it had not caused such very bad results to a Government Department which is trying to do its best to economise. The transport of the London district is known as the "Kennington Area." In the Kennington Area there are two garages, one known as the Kennington Garage and the other as the Belvedere Road Garage, Kennington. All this is set forth in the document. Turning over the page to see the total cost, you find the estimated weekly expenditure of the London Mechanical Transport Section, Kennington. My right hon. friend, by some extraordinary mistake, assumed that this expenditure was to be divided up amongst what are called the touring cars only, and not amongst the total of 238 vehicles. Any man with an ounce of sense in his head would, of course, have said that a sum of £2,700 for a motor car for a year looks very strange, and surely there must be some mistake. I have no doubt that my right hon. friend must have thought so at the time, but the Report went out, and every newspaper in the land deduced from it that the cost of running a motor car was £2,700 a year. I pointed out that the error made was a ridiculous one, and perhaps might have been due to the fact that the word "Kennington" was not known to include Belvedere Road also; but I said I relied upon the Committee to make the point clear. In point of fact, I have been at some pains to get at what the cost of a motor car is, and I believe the cost of running one works out at £593.

The next specific allegation relates to Blandford. *The Times* went so far as to say:—

"The Air Force in particular squanders in a manner which deserves and should receive the severest condemnation. Only yesterday we published a letter stating that in a single camp at Blandford the Air Force is still employing a thousand girls, many of them are conveyed thither in railway trains and omnibuses. The permanent buildings in the camp have only recently been completed, together with a special railway. The story recalls the Slough scandal, and indicates that there is some ground for suggesting that parallels to Slough can be found all over the country."

Can anybody imagine a more scathing condemnation? I found time to get down to Blandford on Saturday. I knew most of the facts, but I thought the House would wish me, in a matter of this importance, to give them first-hand information. The allegation made is that it is worse than the Slough scandal. I do not know that Slough is a scandal, but that implies that, in the view of those who wrote it, it is a disgraceful waste of public money. It is said that we should receive the severest condemnation.

The R.A.F., as I have told the House, comprised at the Armistice nearly 300,000 men and officers. We must have a depot for them. It was decided to place this depot at Blandford. Was Blandford a good place to put it? It was. As the event proved, it is one of the healthiest places in England. Was it right to put the railway there? It would have been criminal folly not to put the railway there. The railway must have paid for itself as a continuous concern over and over again. The next thing is that the girls are brought to their work, and you have to pay 4s. 7½d. a day for them. First of all, why are they brought there to their work? Because the record office is there. The record office should be at the depot. When the Armistice came, would it have been wise to get rid of the record office? It would have been madness. The whole of the pay, pensions, gratuities, and records of every kind in regard to every one of those 250,000 men depend upon accurate book-keeping at the depot. As any ordinary clerk would not know it is not work that anybody can do. Of course, we had to keep the girls on, and we could not put them in the camp as there was no room for them. What was the alternative? It was to remove the camp to where the girls came from. We went into the facts and discovered that that would cost much more. Of course if we had to spend 4s. 7½d. on every girl each day it would have been more expensive. It is not so. Really it cost only £4 5s. 3d. for three months, which works out at 11s. 3d.

Another statement is made as to the number of vehicles. It is said that there are nearly as many motor vehicles at Blandford as when the camp was full. It is not true. There were 133 in use, and now there are 33. The lorries only take the girls from the station to the camp and back. I have estimated the actual cost and on one computation it works out at 2½d. and on another at 6d.

We went into the cost and we found it more expensive to move the camp, especially as the camp will very shortly be moved to Uxbridge, when the demobilisation is complete. There is an exceptional difficulty in the case of the Royal Air Force in returning from a war basis to a peace basis. It is quite different to the other forces in that, first of all, so great a proportion of our costs is the cost of material, whereas, in the case of the War Office especially, the cost of the men is a much larger proportion. Secondly—and this is more important—we have not got a permanent air force. We are building up the new force at the same time as we are reducing the old. It is an extraordinarily difficult task, and I say frankly that the proper criticism to direct against me, and a thing of which I am undoubtedly guilty, is that, in desiring to carry out my duty, I have reduced too fast.

Running through all these comments which have been raised not only in this House but in the Press, I see an idea—that, after all, the Air Force may not be worth while. It is sometimes definitely asked, "What is the good of this Royal Air Force? Is it worth while keeping it? It is fantastic to suppose that you must spend millions of money on an Air Force." That is really to forget the immediate past. I know no one forgets it in this House. It is to forget the present and the future. Take the present only. The R.A.F., I can claim, has already this year saved millions of money and thousands of precious lives. Take the case of Afghanistan. Compare the late rebellion with what happened in 1879. Lord Roberts, than whom there was never a more efficient commander, especially in India, conducted that campaign with extraordinary skill, but it cost £14,000,000 to the Indian Government, let alone what it cost us, and thousands of precious lives. This year again the Amir was deposed and another proclaimed a Holy War, just as before, attacked our frontier posts and called on his subjects to drive us out of India, incidentally, of course, driving out, not so much ourselves, as others. I am not here to say that the Air Force stopped the War, but I am here to say that a great many wise men think so. I will only read what two of them have said. Sir William Birdwood, whose knowledge of India in recent years is unrivalled, said the other day in public:—

"The moral effect of the aeroplane on the tribes (of Afghanistan) must have been tremendous, and it would probably save India scores of rupees and shorten what might otherwise have been a long war."

Then Gen. Sir O'Moore Creagh, the late Commander-in-Chief in India, on another occasion said:—

"With regard to the effect of aeroplanes on war, it was no doubt perfectly true that had aeroplanes existed at the time of the Afghan War in 1878, instead of that war lasting two years, it would have lasted two months at the very outside, and much money and many valuable human lives would have been saved."

I do not think anybody who studies the facts can doubt that the power of the air to save life and treasure is immeasurable, and we must have an Air Force, and a good Air Force. The parallel of Egypt is even more remarkable. We had a rebellion in Egypt, and the censorship was then on. The rebellion was of a most dangerous description, and all communications were cut, railways, telegraphs, telephones, and no communication of any kind was carried on for several days except by air. It was a well-fomented, well-organised rebellion, very much like the previous rebellion, though more formidable, when Lord Wolseley conducted what has been called the model campaign for swiftness and economy, the campaign of 1882—a man of extraordinary genius for that kind of war, and, as I think, for all kinds of war. He conducted that brief campaign, in which most of the troops were only there for a couple of months, and he crushed that dangerous rebellion, but in that short time it cost us £1,800,000. What did our Air Force cost us during the same period in Afghanistan and Egypt? It is difficult to compute, because they had to be there in any case, and in ordinary practice flying they do not use so much, but they use a great deal of the materials that they use in war, but I told those who engage in these matters, finance and other branches, to make me the largest estimating they could, and they put it at £43,000, against £14,000,000; £43,000 against £1,800,000. That would not be a just comparison, for, of course, other troops co-operated, but if it be true, as is indicated, that it was the bombing that stopped the Afghan War and that it was the aeroplanes that quelled the Egyptian Rebellion, it is not too much to say that this country has been saved tens of millions of pounds by having a fairly efficient Air Force. I say fairly efficient, because I know that in India there was much left to be desired in the aeroplanes there. They had all been required on the Western Front, but had there been an efficient force, as we could have had had there not been a European War just before, the cost would have been far less and the result would have been far more decisive.

Sir D. Maclean: The only point that we are trying to elucidate here is as to whether this £60,000,000 or £66,000,000 which has been granted to the Air Force is being wisely and economically spent. My right hon. friend said that these touring cars, cars for personal use, have been cut down to somewhere about six. We are delighted to hear it, and I only want to know when that reduction took place, because I find in this Report, which has been issued as late as August 7, that there is an estimate as to what it cost up to March, 1919, and it gives the total cost and also the total number of cars, at the risk of wearying the House I will read the particulars. It says that in March, 1919, there were: Crossley touring cars, 19; Ford touring cars, 19; Rolls-Royce touring cars, 2; Daimler touring car, 1; Rolls-Royce Limousine, 1; Rolls-Royce laudaulettes, 4; Crossley laudaulettes, 27; Ford laudaulettes, 6; a total of 79. The estimated cost was in round figures £71,000, excluding spare parts (other than tyres) and materials used for repairs and renewals of vehicles, maintenance and repair of buildings and plant, and depreciation of vehicles. What that amounts to I do not know, but I am pretty sure I am well within the mark when I say it is at least £10,000.

There are just three points I shall endeavour to make as briefly as possible, and they appear to me to be these. First, that this work carried on at Renfrew was carried on under conditions which, to put it mildly, have given rise to the deepest suspicion, so much so that my right hon. friend the Lord Advocate, in the official communication which was sent on his behalf on March 6, 1919, said this:—

"Further, a prosecution would reveal what appears to be inefficiency and absence of control on the part of the representatives of the Ministry on the spot."

There is no doubt at all of inefficiency and absence of control. This Select Committee have heard the witnesses, and what is their decision? With regard to this undertaking, Sir John Hunter made a general statement that 70,000 men were not earning their wages, and he goes on further to state that so much was his sense of public duty aroused, that he got a firm of measurers to measure up the work. I would explain that measurers in Scotland correspond to Clerk of Works or surveyors here in measuring up work. He said:—

"A firm of measurers was engaged by me, and their work is now practically complete, and it appears that already there is a sum of about £60,000 charged by the contractor to the job which cannot be accounted for."

I pass on to the other part of the case. It seems to me extraordinarily difficult to avoid the conclusion that here, at any rate, we have come upon something which requires an immense amount of explanation. I quite agree with what my right hon. friend said, that it is rather difficult to bring specific cases. The whole machinery lies with the Government, and it is a very difficult job, as I know from this side of the House, to get together material upon which one feels justified in making a charge, or even asking for an investigation. The public is at a great disadvantage in these matters.

The position which is taken up with regard to two ladies, Miss O'Sullivan and Miss Douglas-Pennant, is also one which requires very adequate explanation. They took a very proper view—this is a woman's job dealing with the question of women's clothing; why not let women inspect? It was even said that 12 women could do what 40 men were not doing very well. No satisfaction comes from protest, and the whole thing is finally left in a way which, to put it mildly, is unsatisfactory to the last degree. The question I want to address to the Government in regard to that point is this. The matter cannot be left where it has been left by this Report, or even by any statement made in this House. It ought to go much further, and it can. There are a lot of public-spirited Members of this House who are quite willing to give up something of the vacation to take up the matter here and get to the bottom of it. And, whatever happens, I beg again, let us have publicity. If there is nothing in these things, that will satisfy the public, but if you have a half-shade of semi-privacy, you will not allay suspicion, and labour and other unrest.

The Lord Advocate (Mr. Clyde): A true appreciation of what took place, a true understanding of the position, can only be arrived at when the facts surrounding the documents are placed before this Committee. That is what I propose to do now. The Renfrew aerodrome was contracted for. There were really two separate parts of the contract, though I am not going into any of the details. The Renfrew aerodrome was contracted for under a contract originally made by the War Office, and subsequently taken over, and retrospectively reconstituted by the Air Ministry. The original contract was somewhere in 1917—I think near the end. I am not sure of the exact dates. But the reconstitution of it was on February 8, 1918. That I do know. By the end of the year 1918 the Air Ministry, after the work had gone on for something like a year and a half—at any rate, the Air Ministry was administrator on its behalf—became aware that the affairs of the contractor were in a state of extreme mismanagement. The information put before me was that as a result of inquiries which he made at that stage—the work having been going on for about a year and a half or more—he had satisfied himself that there was some £50,000 or £60,000 of public money spent for which there was no work to show. I had that information presented to me about the end of 1918. The matter upon which my Department—the Criminal Department in Scotland—was approached by Sir John Hunter had, however, no direct connection with that situation at all. I am afraid that almost

anyone who read this Report would imagine that the £50,000 or £60,000 of public money, which Sir John Hunter complained of was lost, was then the subject of, or was to be the subject of, contemplated criminal proceedings. That is altogether a misunderstanding of the situation. The only information lodged with my Department in reference to criminal proceedings had regard to two paltry sums of £89 5s. 2d. and £196 19s. 3d., or in all £286 4s. 5d. It is upon the fate of the contemplated proceedings in reference to these two sums, and to these two alone, that the whole of the matter of the second and third pages of the Report of the Committee is devoted.

What was the information laid before my Department? It was that these two sums have been fraudulently misappropriated by four subordinates on the Renfrew contract. They were persons who had to do with the cash and business management side of the contract, and the charge was that these four, or one or other of them, had pilfered the cash of the contract and had fraudulently misappropriated to themselves these two sums. As soon as that charge was lodged with my Department I immediately instructed a full criminal investigation through the ordinary channels of criminal inquiry commonly used in Scotland, and the four persons accused were immediately arrested. They were, as usual, required to make a declaration. They all did so, and none of them confessed anything whatever with regard to the charge. The investigation was carried out sometime between the middle of December and early in February, and what were the facts that that investigation disclosed?

The Committee will readily understand me when I say that to bring a criminal prosecution it is not enough to bring a vague criminal charge, or support it by vague evidence. It must be a specific charge, and it must be supported by specific evidence relative to particular sums with regard to which the abuse is said to have arisen. By the middle of February, when these investigations were complete, it became perfectly clear that with regard to the first of the two sums in question any idea of prosecution must be abandoned. The reason was that it was not possible to obtain evidence by which you could define particular entries in the accounts as being unguine, false or inaccurate. Let me explain this. The suggestion by those who made the charge was that there were included in the wages sheets certain entries of wages paid which, in fact, were not paid, but, on the contrary, had been misappropriated by those who made up the wages sheet. The first problem was to identify those alleged false entries.

With regard to the first of the two sums in question, the evidence necessary for that purpose was wholly wanting. With regard to the second of the two sums in question, the evidence was exceedingly thin, although there was some evidence, the difficulties in regard to identification were very great, but there was just some evidence. I therefore had the inquiries exhausted. I think I ought to explain at this stage one feature which the affairs of this contract presented. Its accounts and its bookkeeping were in a state of confusion; they did not look as if they had been kept by experienced persons, and they certainly bore no sign of having been inspected, supervised, or checked by experienced persons. The result was that a great deal of the material for which one ordinarily looks for the purpose of checking the statement and showing it to be correct was in this case unavailable.

I have said that at the outset the difficulty was one purely of obtaining evidence to make the charge specific. That was fatal to the charge in regard to the smaller sum and very nearly fatal with regard to the other sum. With regard to this charge the evidence which was obtainable and was obtained by us completely disposed of the idea that the money in question had been pocketed by any one or more of the four persons charged, and accordingly the whole basis of the information, which was that these two sums had been pilfered by those in control of that part of the cash and business side of the contract, disappeared. That, of course, did not absolutely conclude the question of whether there had been some fraudulent practice in relation to the contract or not, but the Committee will realise how even that hope, if one ought to hope for a prosecution or conviction at any time, was dashed to the ground when I say that even those who were able to say that they understood there were entries in the wages sheet that were not reliable, coupled with the explanation that the entries were made and open to criticism, and represented money actually paid, although not in all cases to the men whose names appeared opposite the sums.

I will explain how that arose. There is a practice, I think, in contracts on both sides of the Border where work has to be done sometimes under very dirty and disagreeable conditions, by which the men obtain what they call dirty money, and it is very often paid. In this work dirty money was asked for when there was dirty work to do, and it was paid. In order to get the dirty money which was paid to the gang which actually performed the dirty work through the wages sheet it had to be entered up in the wages sheet of the week succeeding the week in which the payments were actually made. It was so entered, but care was not taken to enter the money opposite the name or names of the men who actually got the dirty money pay. There were a very large number of men employed on this work. I do not think it was a businesslike method, and it should have been different in order to make these entries accurate, but they were not accurately made. We were told that there were instances in which names were put in and names selected at random in order to cover the money paid as dirty money to somebody the week before.

That was a very reprehensible practice, and nobody would commend it; but the only question I had to consider, and by which I must be judged, is, What was left of the criminal charge? I came to the conclusion that nothing was left of the criminal charge, and accordingly, in the beginning of the month of March, after having carefully personally gone into the whole of the papers in this case, because I knew the Air Ministry were exceedingly anxious that a prosecution should be raised, and having made up my mind—and I see no reason whatever to alter it—that there was no ground whatever for my raising criminal proceedings which I regarded as hopeless, and there was no evidence that would have enabled me to identify the sums with regard to which my charge would have to be made, I made up my mind to communicate to the Air Ministry the fact that I did not see my way to raise any proceedings which I could hope would have any useful result.

I must explain one thing more before I come to my letter of March 6. There were three reasons which guided me in coming to my conclusion. The first of them was that I had not available evidence which would enable me to present a case to the jury; the second was that I had no evidence whatever, but quite the contrary, that the persons implicated had pocketed any of the money; and thirdly, even if there had been a glimmer of hope of presenting a prosecution, I had learned from the evidence obtained that the representatives of the Air Ministry on the spot, if they did not know, certainly ought to have known of the whole matter with regard to the practice of paying the dirty money and the way in which it was entered up. If experience has taught me any lesson it is that if you are asking a jury to convict somebody of fraud, and you have to disclose to your jury that the persons whose business it was to check and control did not exercise supervision and control, but that, on the contrary, by their own neglect they had facilitated looseness and laxity, you are certain to fail. Those three things were all in my mind, and each of them confirmed the other, and when I wrote my letter of March 6 to Sir John Hunter I told him each of the three. I will ask the House to listen for a moment to what I actually said:—

"With reference to your telegram of December 9 last to the Crown agent, and confirmation thereof regarding fraudulent practices in connection with contracts for the Renfrew aerodrome, I am directed by the Lord Advocate

to inform you that, after full inquiry and consideration he does not see his way to order a prosecution. The evidence available is insufficient to afford any strong probability of obtaining a conviction."

In my letter I proceeded:—

"There is no evidence at all that any of the accused applied to their own uses any of the money said to have been improperly obtained from the Ministry. This circumstance, though it does not in itself provide an answer to a charge of fraud, makes the insufficiency of the evidence more formidable than would otherwise be the case. Further, a prosecution would reveal what appears to be inefficiency and absence of control on the part of the representatives of the Ministry on the spot. In view of these considerations, his Lordship regrets that he cannot come to any other decision than that intimated above."

I have nothing to add to or withdraw from those three reasons. I have no reason to think that any one of them is other than good. I was well aware, however, that the Air Ministry was exceedingly anxious for proceedings, and within a few days of the writing of my letter of March 6 I had communicated to me, from the Air Ministry, on March 19, a communication to that Ministry by Sir John Hunter, which occupies the bulk of page 3 of the Report of the Committee. I saw from it, and knew, that Sir John Hunter was grievously disappointed. He was, to my knowledge, exceedingly vexed by the state of things which, after 18 months of work, he had discovered to exist in connection with the Renfrew contract, and, although I think his communication in some respects a little unguarded, I quite appreciated the vexation of mind and annoyance in which he found himself at that time. I accordingly thought it proper to see Sir John Hunter, and we had a meeting accordingly. I did not deal with the detailed criticism in his note. I dealt particularly with that part of it in which he said that he thought a refusal to prosecute created an awkward position for his Ministry and increased their difficulties.

What I pointed out to him was this: I said, "You are grumbling in connection with this contract that £50,000 or £60,000 of public money has disappeared without work to show for it. Even if I raise a prosecution about this £286 worth, and that prosecution ended in success, which it would not, it will carry you no distance at all to the recovery of the public money which you think is lost—the £50,000 or £60,000. Moreover, if you want to show the public what mismanagement there was by the contractor at the Renfrew aerodrome, your best plan is to raise civil proceedings for the recovery of that £60,000." I told him that I thought it could be done, and I said, "If you want to get at the real thing, the £50,000 or £60,000, do not waste your time and waste public money in a futile attempt to prosecute these underlings for a paltry £286, in which I think you will fail, but expose the whole affair in Court in civil proceedings for the recovery of the £50,000 or £60,000." I said more than that. I said, "I cannot see my way to go on with this prosecution, which you want. It will not do, but if you take civil proceedings and the result of inquiry in the civil proceedings is to reveal evidence which I have not got into touch with now or to put a different complexion on the reports of this £286 which are before me at the present moment, I will reconsider the question of criminal prosecution when the civil proceedings are over."

I cannot help regretting that the only indication in this report that I had any meeting with the administrator at all is at the very end of paragraph 6 on page 3, where the matter is dismissed with the statement, "Later, the witness saw the Lord Advocate personally, but he refused to alter his decision." I think it is to be regretted that the actual position in which this matter was left in the month of March was not distinctly stated, for I think if that had been stated a very different complexion would, for outsiders, who knew nothing of the circumstances, have been put upon the events which have occurred. I ought to add this, that I saw the administrator personally more than once. I confess that I thought he was perfectly satisfied with the advice I had given him. I had not the remotest idea that when his own administration of the Air Force affairs was inquired into, he was going to flourish in the faces of the Committee my refusal to prosecute these poor underlings for £286 for alleged peculation, and his somewhat violent letter of protest as a kind of smoke screen behind which to avoid any further discussion of the matter.

I must deal with his letter paragraph by paragraph. The first paragraph in the letter has the sting in the tail of it. It is on the top of page 3:—

"Any question, therefore, of the possible effects of the prosecution in revealing inefficiency and lack of control on the part of representatives of this Department on the site should be ignored altogether. As the person most affected I cannot concur in the view that such a question should be allowed to affect the legal question in the case."

If by that is meant that no regard must be had to persons in respect of criminal prosecution, I should agree with him, and unless he had misread my letter he knew from its terms that one of the reasons which led me to the opinion that even if there had been a charge, on putting some kind of a case to the jury I should have hopelessly prejudiced the case by revealing to the jury that any amount of opportunity was open to anybody on that contract through the negligence, irregularity, looseness, and failure of duty on the part of subordinates of the Air Ministry. The next paragraph says:—

"I find it very difficult to understand how a criminal charge cannot be formulated and a conviction obtained, having regard to the admissions made, and in some cases signed by persons charged."

Here there has been either a lapse of memory or some complete misunderstanding. There was no admission or signed confession by any one of the persons charged. They have all emitted a declaration, but there was nothing whatever in the declaration. If they had made a confession or signed a declaration there would be a plea of guilty. In the next paragraph he says:

"It is admitted that the books and time sheets were falsified by entering thereon the names of men said to be employed on the job, but who did not, in fact, exist. Wages were drawn regularly and charged as having been paid to these men. Where did that money go? The Lord Advocate says there is no evidence that any of the accused applied to their own uses any of the money said to have been improperly obtained from the Air Ministry. But would not any jury on the facts above stated draw the obvious inference that the persons responsible for putting these 'dead men' on the books and drawing wages regularly for them from Government funds, had, in fact, put the money in their own pockets?"

I daresay they would, but no case could have been brought which left the facts in that position. On the contrary, the facts brought out by the prosecution would inevitably have shown how that money was disposed of, and the inference which Sir John Hunter thinks might easily have been drawn would when the facts were known have been blown out of the water. In the next paragraph the letter says:—

"But I wish to carry the matter further and to point out that the position, if no prosecution is attempted, is, in my opinion, more serious for the Air Ministry than if a prosecution should be started and fail."

That was the matter with which I dealt when I saw him, and suggested the advisability of not wasting his time and public money by a criminal prosecution of the underlings, but that he should deal with the matter by raising civil proceedings. The next three paragraphs do not require any notice, but the fourth paragraph contains at the end this sentence, which deals with the same matter:—

"Even if the prosecution should fail on whatever charge was formulated, the evidence must be such as to strengthen the position of the Government against the contractors and save money to the country."

In my opinion it would have done nothing of the sort. Then there comes at the end of his communication the singularly bald statement,

"Later the witness saw the Lord Advocate personally, but he refused to alter his decision."

The comments which have been made not in this House but outside this House with regard to this matter have been full of the suggestion that my purpose, or at all events the effect of what I did, was to shield somebody in the Air Ministry from exposure. How baseless that suggestion is appears the moment it is known that my advice to the administrator when I saw that a prosecution must fail was to expose the whole matter in open Court in a civil action. I think I need say nothing more about that except perhaps this, that I was aware that the administrator would much have preferred criminal proceedings if those could have been raised, but for the reasons which I indicated I thought, and think, that that was out of the question. Lastly, I ought to say that the civil proceedings which I advised as early as March have been under instructions recently obtained and taken in hand and their commencement is now imminent.

Sir F. Banbury: The Sub-Committee of which I have the honour to be chairman has sat two days a week ever since it was appointed last March, and in addition there are the meetings of the main Committee and other work the members have to do. It is very easy to say, "Why do not you make specific charges?" Anyone who has sat on one of these committees and who desires to do his duty to his country and the House of Commons, knows it is not possible to make specific charges unless evidence is brought before you to that effect, and it is not always easy to get evidence on these specific points. I do ask the House to recognise that all we wanted to do was to put facts before it, and if we have erred at all it has been on the side of not making known everything we have found out. My right hon. friend alluded to the scrapping of aeroplanes. We made a recommendation to which my right hon. friend referred this afternoon. I understood him to say that we suggested it might be more economical to burn the aeroplanes, but we did not make a recommendation that they should be burned. The recommendation which we did make, and which we made with the approval and concurrence of officers on the spot, was that instead of having a number of women occupied in taking to pieces the various aeroplanes and making huge piles of wood, some other course should be adopted. We wanted to know what was the use of doing what they were doing. We saw a huge pile of wood, consisting of parts of aeroplanes, and we asked what was happening to it. They told us that they had been able to sell it at a very small price per ton, but the contractor who took away one ton then declared that he would take no more, but would prefer to break his contract, because he had made a loss on that ton. It was not known what to do with the wood; they could not get rid of it. The Committee suggested that certain parts might be set aside, and the remainder, which was unsaleable, divided up and got rid of. What we wanted was to save the large amount of money which was expended by employing women on this work.

With regard to the cars, let me come back to that question for one moment. Is it necessary that certain officials in one particular Ministry should have cars to take them to and from their houses? We thought not. I go further. My Committee recommended in its Report that we should make a start with the very highest official, with the Minister himself. We believe we shall never get economy unless the very highest people give a lead. Why should the country be put to the expense of keeping a Rolls-Royce or some other big motor car to be driven by a lady, or, it may be, a man, to take a high official to and from his house? It is absolutely absurd; such a thing never took place before the War. Never in this country were conveyances found for Ministers. Let them find their own cars, or else travel by tube, or even walk, as I do on many occasions. Nobody in this House works harder than I do.

Let me next say a few words, and it shall be a few only, on what the Lord Advocate has said. I saw my right hon. friend myself. I had a long conversation with him about the matter. I wrote him a letter in which I said we should have to allude in our Report to his letter. I gave him every opportunity of coming before the Committee to make any explanation he might think proper. My right hon. friend did not come. As the House knows, a Committee has power to compel attendance, but that is never exercised, as I understand, in respect of those occupying the position which my right hon. friend occupied. I understand it is the practice for the Chairman of Committees in such cases to suggest that if the right hon. gentleman cares to attend he can do so, but at any rate we did not have the privilege of hearing my right hon. friend. Sir John Hunter, on the other hand, did attend at very great inconvenience, and laid evidence before us. I do not know whether he was right or wrong in the conclusions at which he arrived. But I think there is one conclusion which the House will draw, and that is that the affairs of the Air Ministry at Renfrew were so inefficiently conducted that a very capable lawyer like my right hon. friend could not find sufficient proof on which to found a prosecution. That there was a very large loss of money is evident, because there is a civil action pending for something like £60,000. My right hon. friend said that the amount which these four people were supposed to have taken was only £286. What on earth does the amount matter? The point was this. Here was a specific charge, and supposing even it had failed, would it not have had an effect upon Government offices generally by making it known that whenever cases of fraud were found prosecution would follow, and if inefficiency and want of control were shown on the part of the representatives of the Department on the spot, then those representatives would either be dismissed or prosecuted. There was a fifth gentleman connected with this matter. He was at the War Office. He held a commission. He is a Canadian. He went to Canada, and I want to know what is going to happen in his case?

How does my right hon. and learned friend know that if he had instituted proceedings someone would not have come forward to give evidence in order to save his own skin? Once you begin proceedings you cannot tell what sort of evidence will come out as a result. Therefore I repeat first of all that the Committee were justified in putting before the public the evidence which was placed before them, and I repeat the regret which I believe all the members of the Committee share, that the Lord Advocate took the view which he did under these circumstances.

The particular contract was a time and line contract. The Committee of which I was chairman last Session or the Session before investigated the Office of Works. Every single man at the Office of Works protested against a time and line contract, and we in our Report said, Do not go on with the time and line contract. The Ministry of Munitions and the War Office were, I believe, the only people who insisted on going on with this time and line contracts. The result of it is that it is the interest of the contractor to pay as high wages as he can, and to get as little work done as he can, and then he sends in a big bill on which he gets 5 per cent. or 10 per cent., or whatever it is.

Mr. Lambert: The right hon. gentleman (Maj.-Gen. Seely) brought in the question of railway tickets and one thing and another. The real point I want to put to him is this. He told us these Air Estimates of £66,000,000 are not peace Estimates. Will he be good enough to tell us—and we ought to have known that already—what does he expect will be the peace Estimates of his Department. After all, the Armistice was signed in November. The House of Commons has a right to know from the Air Ministry or the Secretary of State for War what are the peace Estimates to be. Sixty-six million pounds is a preposterous figure. I should cut it down, without the smallest hesitation, to a tenth of that figure. But, in reality, the trail of extravagance

is over it all. Sir John Hunter's Report says that of 70,000 men who were employed not one was earning his wages. That is not a legal point. That is the point of a practical engineer skilled in dealing with labour. I have a case here. The Air Ministry employs unskilled labour in the eastern counties attracting all the men away from the agriculturists, paying double wages. I want the men to get good wages, but how can you expect the farmers to produce food when officials of the Air Ministry persist in paying actually double the wages which are fixed by the Agricultural Wages Board? There is another point I want to put. The Air Ministry had large contracts for aeroplanes on November 11. How many of these are being delivered now? I was actually told of a case, a few days ago—and I put it here plainly to the House—that aeroplanes are being manufactured to-day, the Air Ministry is taking delivery, material is being used, labour is being used, and the taxpayers' money will be spent in making aeroplanes which could be of no possible use whatever to anyone. Is that so? If it is so, eight months after the Armistice was signed, there is a serious ground of complaint on behalf of the House and the country against someone at the Air Ministry.

Mr. N. Chamberlain: Sir D. Maclean put his finger on the spot when he said that there was no central control.

It seems to me that the only way to get that is to have what does not exist now—that is someone in an independent position in every great spending Department whose business it is to review and check expenditure, to question it, to say whether it is necessary, to make representations to the head of the Department, if he considers that it is not necessary, and if he does not get satisfaction from him to make representations to some outside authority, and that outside authority it seems to me should be the Treasury. I noticed that the Select Committee in their Third Report spoke favourably about the financial part of the Air Force, but they said that the Assistant Financial Secretary had not got sufficient powers. He had not sufficient powers, and he never will have sufficient powers so long as he is subject to the Secretary of State for that Department. There is already in the Air Force an Assistant Financial Secretary. All I propose is that his salary should be paid by the Treasury instead of by the Air Ministry. He would then be a Treasury servant and would be responsible to them. He would be doing his duty by them and by the House of Commons too, when he made representations, and if they were not listened to he could say, "I shall have to report this to the Treasury or the Select Committee on National Expenditure when they come to review the affairs of the Department."

The Secretary of State for War (Mr. Churchill): The very important and helpful speech which has just been delivered by Mr. Chamberlain will, I think, make the House feel that much is to be said for both sides, which have, I think, so far been represented in this discussion. I think that the Government is entitled to some sympathy from the House, and I think that the House is also entitled to a sympathetic comprehension of its difficulties and its position on the part of the Government. Sir D. Maclean, and the hon. gentleman who has just spoken, both said in effect, "We have had very good answers, very effective answers, but however good the answers are, the Government will acknowledge, with its preparations, its officials, and its organised apparatus of public information in marshalling the facts, that the expenditure goes on. We are still being drawn steadily along the path which no one can doubt must ultimately, unless our progress is arrested or deflected, result in very grave public and administrative disaster." That has been, I am sure, the feeling in the House during the whole of this debate. Let us be quite fair with one another. I agree that Government answers on points of detail are no answer to the grave feelings of anxiety, and the undoubted mass of substantial facts which support the view, that our expenditure at the present time is a grave public danger. On the other hand, I think that we are entitled, when definite specific points of policy are attacked, when allegations of a very injurious kind are made, to make precise and definite answers.

Various questions have been raised in the Report of my right hon. friend the member for the City of London, and these points have figured in the speeches of various members who have taken part in this debate. There has been the clothing contract which was referred to, I think, by my right hon. friend opposite, and which acquires a special interest because of its association with the activities of Miss Douglas-Pennant. On that the House will remember that from the very beginning of the year I have been engaged in a correspondence with Miss Douglas-Pennant, inviting her to make any charge of corruption or immorality which could be brought to the test of judicial investigation, and I have published to the House reams of correspondence which have taken place with that lady, in which I have been endeavouring to induce her to state a case for inquiry into a definite matter of a criminal or highly culpable character. Any hon. gentleman who likes to read that correspondence will see that no suggestion of any kind has been put forward which constitutes a fulfilment of that requirement.

I am in possession of the House, and members can read the correspondence for themselves, and form their own opinion. However late in the day charges have been made by a Miss O'Sullivan in regard to a particular contract, and the moment those charges were made, the very same day, I think, that they assumed a definite form, an official inquiry was ordered, and that inquiry is now taking place, and until that inquiry has taken place I do not feel that it would be an advantage, and certainly it would be improper for me, to take any part in the discussion. But this I do say, that the results and process of the inquiry shall be made public and laid before the House, so that everyone may judge for himself.

Then there are the allegations connected with the Renfrew Aerodrome. I am entitled, speaking at this stage in the Debate, to say that after the statement of my right hon. friend (the Lord Advocate) no further reference to the question of prosecution is required from me. There was only one by-product which arose out of this, of which I must say one word. One of the allegations was that a military officer who was involved in these proceedings was not tried by court-martial on the demand of Sir John Hunter. The officer was a Canadian lieutenant. He was not employed under the War Office. He was employed under the Air Ministry in Sir John Hunter's Department. Sir John Hunter wrote to the Adjutant-General to demand that the officer should be placed under arrest, but the reason he gave was this: "I am unable to formulate any definite charge against him under civil or criminal proceedings, but I demand that he shall be placed under arrest." The Adjutant-General, not unnaturally, refused to take such a step against a Canadian officer, who is to a very large extent, except in case of emergency, outside the War Office jurisdiction, unless there is the prosaic formality of a definite charge in the first instance.

But this officer was detained by the Canadian authorities at our request for upwards of three months in this country until the Crown Counsel in Scotland and the Lord Advocate's Office had definitely reported that there was no material charge against him which could be made the subject of a criminal investigation. As I say, for my own part there is nothing which would give me greater pleasure than to order a criminal prosecution against a person guilty of fraud at the present time. There is nothing which would be easier for a Minister at the head of a Department to do, if the facts warranted it. He has nothing to lose by it; he has everything to gain.

I read the Report of the Select Committee with the greatest interest and I must say that I know how very hard their task has been and how much we owe to them for their devotion to their work and for the long hours they have spent in laborious investigation. At the same time, in regard to this

question of the aerodrome contracts, it does seem to me that they have very largely missed the main issues. Let me take the House back to the autumn of 1917 and the early spring of 1918. What was the position? Aeroplanes were being made in great numbers; they were coming forward; pilots were being trained; but aerodrome construction was lagging heavily behind. Everything was being concentrated on a supreme effort for the years 1918-1919, and I think it is only fair to those who were then responsible for the Air Ministry to say that had the war not come to an end when it did, the exertions that they made—exertions conducted under the conditions of war, which led to great financial improvidence—it is only fair to remember that those exertions would, in all human probability, have placed us in a position towards the end of the present year to be absolutely supreme in the air, and possibly to terminate the struggle from the air alone. We must not forget that. In those days, when only the dregs of adult manhood remained for ordinary outdoor labour and construction, when our labour market was completely disorganised by continued war-time grants of wages, when there was the most supreme urgency to get on with the work, Sir John Hunter was appointed—I think by Lord Rothermere, or else by Lord Weir—to look after the aerodrome construction of the Air Ministry, and to bring that great element in our air policy abreast of the aeroplane and the pilot. Sir John Hunter addressed himself to this task with the very greatest energy and with immense personal force, and I do not think it was possible to have chosen a better man to have got the work done. At the same time, he is a man who is accustomed, like many of these big business men in their private affairs and businesses, to act on his own responsibility with a very free hand in giving orders of all descriptions, and not always to bother about the formalities of Treasury finance and accounting.

When in January of the present year I became responsible for the Air Ministry, I confess to the House that I had a good many misgivings about the state of the aerodrome works finance and contracts of the Air Ministry. My attention was drawn at the end of February by Sir James Stevenson, who belongs both to the Air Ministry and to the War Office, and who is advising me on business matters, of which he has great experience—my attention was drawn to the state of the finances and accounting for the whole of this great area of work. After much consideration I saw clearly that matters could not be left where they were, and I was advised to appoint Messrs. Price, Waterhouse and Company, probably the best firm of chartered accountants in the country—one of the best firms, a firm with a reputation second to none—to make a special expert investigation into the whole of this subject of aerodrome contracts and finance. They have been engaged on that task for five months, and several of their reports have already come to hand. The Comptroller and Auditor-General shortly after this began to move, and he drew attention to the unsatisfactory state of affairs in this branch of the Air Ministry's finance. I should like the House to realise that the constitution in these matters may not work as quickly as hon. members may desire and as the times may demand, but the constitution and machinery of Government work steadily and faithfully. The Comptroller moved the Treasury, and the Treasury wrote to the Air Ministry, and we then told them what we had already done. They approved the setting up of this expert inquiry, but, in addition, they had an inquiry of their own, under Sir Maurice Fitzmaurice, and they asked that Sir Gilbert Garnsey, who is a partner in the firm of Price, Waterhouse, and Company, and whose admirable work I had become acquainted with during my tenure of the Ministry of Munitions, should be co-opted on the Treasury Committee as well as continue expert investigation on behalf of this firm.

There were the long delays in making peace with Germany, delays in demobilisation of the Army of the Rhine. That demobilisation has now begun. We have arranged with France that by October 31 our forces on the Rhine may be reduced to the dimensions of a strong brigade.

We had, practically speaking, no Air Force before the war, and at the end of the war we had the finest Air Force in the world. This year the demobilisation of the Air Force follows and keeps pace with the demobilisation of the Army; as a matter of fact, it has gone on somewhat in advance of it. The Army has been reduced to about a quarter, and the Air Force has been reduced to about a fifth, of its Armistice figures, and that process is going to continue. What of next year? I see statements in the papers and from various high authorities that we are planning the permanent structure of the Air Force on the basis of it costing twice as much as the whole of the Army before the war. Twenty-nine millions multiplied by two would be £58,000,000, and if you were to allow for prices it would be £116,000,000 at least, but that, I presume, is not intended. We will say, therefore, £58,000,000. Who has ever suggested this? Who in a responsible position at the Air Ministry or in the Government has ever suggested such a scale for our air defences in the future? Personally, as a provisional decision for us to work by until the whole question of our defences can be considered in relation to our financial situation, I have pursued the following policy. I have instructed Sir Hugh Trenchard that he must provisionally frame his scheme within the limits of £25,000,000 a year, which is equal to something less than £12,000,000 a year on the pre-war basis, and I have offered him all possible support in the measures which he has recommended. Here let me say that this is a matter of policy which Parliament and the Cabinet may review. I am telling the House quite frankly the course which I am now pursuing, so that it can be criticised and argued on both sides. I observe that the Committee presided over by my right hon. friend the Member for the City of London, in its third Report, after taking two pages to deal with the Renfrew episode, and two more pages to deal with the clothing contracts, and two more pages out of the seven to deal with the cases of the motor-car garages and the complexities of Kennington and Belvedere Road, include this small but very significant paragraph, No. 28:—

"The Sub-committee examined Major-Gen. Sir H. Trenchard (Chief of the Air Staff), and are of opinion that he is doing all that is possible to cut down expenditure while having due regard to the efficiency of his Department."

I think I am entitled to take my stand on that. I hold most strongly that an earnest and resolute effort must be made to reduce the cost of national Government, even if it involves the abandonment of cherished schemes and of many projects which are desirable and useful in themselves. I am of the opinion that the risks of the financial situation are such that risks in other directions must be faced. I believe that it will be found, in these four or five years after the war, that the best course for the armed forces of the Crown is to aim at scientific progress and quality rather than mere numbers or instant readiness for action. Reduction of expense, as I have said, can only be obtained by discharging officers and men from the Army and Air Force as quickly as the situation allows. Every effort will be made to obtain the decisions of world policy, which in some cases are necessary before we can proceed upon our path. I go all the way with the House and with those out of doors in feeling that this question of the reduction of our expenditure upon armaments, after making due allowance for the absolute change in nominal values and the decline in purchasing power which has occurred, is the first need which we have to face in this House and on this Bench, but I shall not myself become responsible, whatever the pressure may be, for the maltreatment of the Army during the years which follow immediately after the war, nor for any policy which denies to the Royal Air Force a permanent and an effective and an independent means of existence.

Aeroplanes for Indian Frontier

CAPT. R. TERRELL, in the House of Commons, on August 11, asked the Secretary of State for India whether the supply of aeroplanes on the North-West Frontier has been adequate; and whether there has been any adverse criticisms of the types of machines employed?

The Under-Secretary of State for Air (Major-Gen. Seely): Owing to transport difficulties, there has been delay in supplying the forces of India with the required number of machines of suitable types. These deficiencies will have been remedied at a very early date.

Mr. Billing: Was the officer responsible for selecting these types of machine an officer experienced in aviation in India, and is the right hon. gentleman aware that machines which will fly in this country will not fly in India?

Major-Gen. Seely: The officers concerned had full knowledge of that fact. It is a fact that suitable machines could not be got to India in time owing to extraordinary difficulties of transport, but that is being remedied.

Capt. Terrell: Will the right hon. gentleman answer the last part of the question, and say whether there has been any adverse criticisms on the types of machines employed?

Major-Gen. Seely: Yes, from here and from there. We did not get the right type of machine for the purpose, but that is being remedied. We could not get them there owing to the shortage of ships.

The W.R.A.F.

LIEUT.-COMMANDER KENWORTHY asked the Under-Secretary of State for the Air Ministry what was the numerical strength of the Women's Royal Air Force, officers and other ranks, respectively, on the 1st January, 1st July, and 1st August, 1919; what steps are being taken to demobilise the remainder of the officers and other ranks; and what is to be the future of this force?

Major-Gen. Seely: The numerical strength of the Women's Royal Air Force at the dates mentioned by my hon. and gallant friend was as follows:—

	Officers.	Other Ranks.
1st January, 1919	545	24,911
1st July, 1919	434	18,282
1st August, 1919	407	15,700

The force is being demobilised as quickly as circumstances will permit, with the object of reducing the numbers to about 3,200, at which figure it is intended the post-War strength of the force shall be fixed. It has already been stated to the House, in answer to a question put by the hon. and gallant member for the Fylde Division of Lancashire on the 3rd July, that it is not intended to disband this force.

Air Ministry Contracts

Mr. DAWES asked the Under-Secretary of State to the Air Ministry (1) whether he is aware that the Select Committee on National Expenditure have recently reported that replies given to them by Major Cockburn, Royal Air Force, in connection with certain clothing contracts, were contradictory and unsatisfactory; what is this officer's war record; whether he is still on the active list; and whether it is proposed to take any and, if so, what action in connection with the matter;

(2) Whether he is aware that the Select Committee on National Expenditure have recently reported that they were unable to attach any credence to the statements made to them by Col. Latimer, Royal Air Force, in connection with certain clothing contracts; what is the war record of this officer; whether he is still on the active list; and whether it is proposed to take any and, if so, what action in connection with the matter; and

(3) Whether he is aware that the Select Committee on National Expenditure have recently reported that replies given to them by Col. Bersey, Royal Air Force, in connection with certain clothing contracts were very unsatisfactory; that this officer ignored the request of the Committee to come before them for further examination; what is this officer's war record; whether he is still on the active list; and whether it is proposed to take any, and if so, what action in connection with the matter?

Major-Gen. SEELY: The answer to the first part of the first two questions is in the affirmative, and to the first part of the third that the complaint of the Committee is that Colonel Bersey did not attend at all, and not that his replies were "very unsatisfactory."

The facts asked for about the three officers mentioned are as follows:—

Major Cockburn was transferred from the Army to the Royal Air Force as from April 1, 1918, and was employed at Headquarters up to October 24,

1918, first with the Directorate of Manning and then in the Directorate of Air Quartermaster Services. He was then transferred to Headquarters Midland Area, where he remained until he was demobilised on February 21, 1919.

Col. Latimer was employed in an administrative position first at South Farnborough, and then at the Air Ministry, from October 12, 1916, until May 3, 1919, when he relinquished his commission.

Col. Bersey joined the Service on October 29, 1917, and was employed in an administrative capacity under the Air Board and Air Ministry until September 30, 1918, when he was transferred to No. 7 Royal Air Force Reception Depot, where he remained until his transfer to the unemployment list on April 25, 1919.

As regards the statement that Col. Bersey ignored the Committee's request for his attendance, the only information I have is that contained in the Committee's Report and a letter which appeared in the Press from Col. Bersey's solicitors, explaining his non-appearance; but in fairness to this officer I must state that there has been nothing in his conduct, so far as the Air Ministry are aware, to show that he wishes to avoid examination, and that in point of fact he is attending in London to give evidence before the O'Sullivan Court of Inquiry.

As regards any action which it may be desired to take in regard to these officers, I cannot, I am afraid, make any statement until the findings of the Court of Inquiry just referred to have been received. My right hon. friend the Secretary of State for War gave an undertaking yesterday that the results of proceedings of this inquiry should be laid before the House.

Mr. Briant asked the Under-Secretary of State to the Air Ministry if the attention of the Air Ministry was drawn to the statements of Sir John Hunter that there had been fraudulent conspiracy in connection with the carrying out of contracts; and if no action was taken because a prosecution would reveal what appears to be inefficiency and absence of control on the part of the representatives of the Ministry on the spot?

Major-Gen. Seely: I have nothing to add to the reply I gave to the hon. member when he put a similar question to me on August 11.

R.A.F. Establishment

Mr. BETTERTON, on August 14, asked the Chancellor of the Exchequer whether he has made any estimate of the saving which could be effected in expenditure by a revision of the Royal Air Force establishment, in view of the termination of the war?

The Under-Secretary of State for Air (Major-Gen. Seely): This question has been under constant consideration and a provisional establishment has been drawn up which shows very substantial reductions. That establishment is now undergoing further revision with a view to reducing expenditure. The results will be embodied in the detailed Air Estimates, to the presentation of which, during the autumn, my hon. friend the Secretary of the Treasury referred in his answer to the right hon. Baronet the Member for the City of London, on the 11th inst.

Mr. Grant: Has the right hon. gentleman considered the desirability of demobilising the women of his Department?

Major-Gen. Seely: Yes, sir. As I announced in my remarks the day before yesterday the women will be reduced very shortly from the large number they were to 3,000, comprising only those employed on domestic service.

Commercial Aircraft Competition

LIEUT.-COL. MALONE asked the Under-Secretary of State to the Air Ministry whether it was proposed to hold a competition for commercial types of aircraft; and, if so, when particulars would be published?

Major-Gen. Seely: Yes, Sir. During the war the paramount necessity in aircraft design was military efficiency, but for the successful development of aviation the first essential is safety. The Government have accordingly decided to institute a competition with a view to obtaining a type giving greater safety. Any machine which succeeds in qualifying will represent a great advance in respect of safety and comfort over any machine at present in use. The Treasury have agreed to the competition, and I am sure that, even at this juncture, the House will not grudge the funds for the prizes. Prizes will be offered for three types of aircraft—a smaller aeroplane, a larger aeroplane, and a seaplane, respectively. In addition to the advantage to civil aviation the lessons learnt will be of the greatest value to the Royal Air Force. The precise terms of the competition will be announced in a few days. If all the competitions are won, the amount required for prizes would be about £64,000.

AIR MINISTRY CONTRACTS

Sir JOHN HUNTER has sent the following reply to the Press:—

"The Lord Advocate, in his speech in the House of Commons, on Tuesday last, upon the Report of the Select Committee on National Expenditure on Air Ministry affairs, thought it necessary to make a somewhat violent attack on me, which I feel cannot be allowed to pass unchallenged.

"In *The Times* of Wednesday, August 13, he is reported as having referred to me in the following terms:—'I had not the remotest idea that, when his own administration of the Air Force was inquired into, he was going to flourish in the faces of the Committee my refusal to prosecute those poor underlings for £286 for alleged peculation and his own somewhat violent letter of protest, as a kind of smoke screen behind which to hide further discussion of the matter.'

"In any controversy with the Lord Advocate I am at a disadvantage, as I am not capable of dealing in debate with a skilled Advocate, but I am quite capable of stating actual facts fairly and truthfully, whereas the Lord Advocate has not done so.

"Let me state shortly the true position which must have been known to the Lord Advocate at the time he made his speech. As Administrator of Works and Buildings at the Air Ministry I was summoned to give evidence before Sir Frederick Banbury's Committee. I obeyed the summons. During my evidence I was asked if any cases of fraud had to my knowledge arisen on any of my contracts. I mentioned the Renfrew contract as the worst case known to me.

"The Committee asked me what action I had taken in the matter, and I told them that the papers had been put before the Crown Authorities in Edinburgh with a view to criminal prosecution against certain persons. The Committee then called for the papers on this subject, and, of course, I again obeyed, and produced the letter from the Lord Advocate to the Air Ministry, and my letter to the Air Ministry commenting on the Lord Advocate's decision.

"I had nothing to do with the decision of the Committee to comment upon this correspondence in their report, but when the Chairman of the Committee informed me that it might be necessary, in their opinion, to do so, I expressly stated that, in my opinion, having regard to the fact that civil proceedings were pending, it might be inadvisable to do so. I asked the Chairman for permission to communicate with the Lord Advocate, and to inform him that the correspondence had been given to the Committee, but was informed by the Chairman that he had already seen the Lord Advocate, and had informed him that the Committee had seen the correspondence, and that the Committee regarded the matter as very serious.

"Thereafter I called twice on the Lord Advocate personally, but was not fortunate enough to find him in his office, but I informed his secretary of what had occurred before the Committee. It now appears that the Committee invited the Lord Advocate to appear before them, but he was content to write to the Chairman the letter which appears in the Committee's Report, in which he states that 'his Department's letter speaks for itself.'

"It is curious that this letter which is to speak for itself, is spoken of thus by the Lord Advocate in his speech in the House of Commons:—'Possibly it may have been inevitable that my letter in particular may have raised some misconception either in the minds of the Committee or still more in the minds of those outside this House who make it their business to comment on public affairs, but a true appreciation of what took place and a true understanding of the position could only be arrived at when the true facts connected with these documents are placed before the House.'

"The documents already published will give ample proof that it was not I who was asking to avoid discussion on the affairs of my Department.

"I cordially agree with the Lord Advocate that he received me when I called upon him with the utmost kindness, courtesy, and sympathy, and the same also applies to the Solicitor-General for Scotland, whom I saw on several occasions. I have always recognised that the Lord Advocate's opinion on matters of law must be final, and have never criticised that, even though I did not agree with it, but I regret that he should have diverted the attention of the House from the real point at issue by making it appear that I was anxious to prosecute some 'poor underlings' charged with peculation of 'two paltry sums,' and to take no action against the contractor to recover the very large sums which could not be accounted for.

"This suggestion was both unproved and unfair. The Lord Advocate knows that the fact that civil proceedings can be taken against the contractor to recover these sums is due entirely to my action in this matter when I first heard of the state of affairs at Renfrew, and he knew that I never intended the criminal proceedings against members of the staff to be an alternative of the civil proceedings against the contractor.

"My thought was that both proceedings could be taken concurrently. Those who are described by the Lord Advocate as 'poor underlings' were in fact not 'underlings' at all, but were the persons holding the most responsible positions on the job, and the fact that the charge involved 'two paltry sums' is due to the request of the Crown Authorities that the evidence should be directed to proof of specific sums having been wrongfully dealt with."

GENERAL SYKES'S VISIT TO THE AMSTERDAM EXHIBITION

MAJOR-GENERAL SIR FREDERICK SYKES, Controller-General of Civil Aviation, and a number of the officers who accompanied him on his recent visit by flying boat to the Amsterdam Aircraft Exhibition, have furnished some impressions of their stay in Holland and, incidentally, of the effect of the arrival of the British flying boats at Amsterdam.

The cordial reception accorded to the visitors and the kindness of General Snyders, President of the Exhibition General Committee, late Minister for War and the Navy, equally with the courteous attention and hospitality of all with whom General Sykes and his staff came in contact, engendered a very favourable sense in regard to the possibilities of civil aerial traffic between the two countries and of the mutual good feeling which exists between Britain and the Netherlands, the significance of which cannot be overrated.

This spirit was clearly evidenced in the speech made by General Snyders at a dinner given to General Sykes at the exhibition grounds on the first evening of his visit, when General Snyders expressed the gratitude of Holland for British support in the past, and explained, with regard to the organisation of the exhibition, that they had received more assistance from Great Britain than from any other country, and looked upon our help as having given life-blood to the project. In his reply, General Sykes drew attention to the important fact that in the development of the world's great air routes Great Britain and the Netherlands have many interests in common. On the Australian route for example, many of the points of vantage are in the Dutch East

Indies, and therefore we ought to get together and work in unison.

The handling of the flying boats on arrival at Amsterdam was regarded by the Dutch people as an extraordinary example of the advance achieved in airmanship during the War. The five machines, flying in formation, circled over the exhibition building and aerodrome before landing in Amsterdam Harbour. Formation flying was an entirely novel spectacle, and in conjunction with the landing on the water, when each machine descended on the same spot at regular intervals of two minutes each, it produced a remarkable demonstration of enthusiasm. It is, of course, understood in Holland that the flying boat and seaplane are types of aircraft particularly suited to the requirements of the Netherlands, which, as is well known, are intersected with broad waterways.

General Sykes chose the air as his means of conveyance simply because it offered the most expeditious and comfortable travelling; it is noteworthy that the five flying boats accomplished the outward journey from Felixstowe in less than two hours and returned against a head wind in under three hours. As the flight was conducted as a routine duty and passed without mishap to any of the machines from start to finish, it emphasises once again the practicability of utilising these craft for regular North Sea services and for over-water communication under similar conditions.

On departure from Amsterdam the British flying boats were given a send-off by two Dutch seaplanes and a number of the Allied aeroplanes participating in the exhibition.

Finns Honour Flying Boat Pilot

To celebrate the recent flight from this country to Helsingfors, the Finnish Minister, Monsieur Ossian Donner, gave an informal dinner, on the night of August 13, at Claridge's Hotel, to Major Sitwell, D.S.O., and Capt. Bailey, navigator and pilot of the F. 5 flying boat in question. The following also were present:—Senator T. Wegelius, of the Finnish Legation; Major-General Swinton, of the Civil Aviation Department; Air Commander R. M. Groves, and Major Field, of the R.A.F., and Mr. Temple.

The R 34's Stowaway

AIR MECHANIC WILLIAM BALLANTINE, who made the trip across the Atlantic as a stowaway on the R 34, and was left behind there, has now reported to East Fortune. It is understood that no disciplinary action has yet been taken in the matter.

The Drzewiecki System of Propeller Design

We are asked to correct a date quoted in Lord Weir's paper entitled "Some Developments in Aircraft Design and Application during the War," given before the North East Coast Institution of Engineers and Shipbuilders on July 10, 1919, and which was recently published in *FLIGHT*.

The date of 1882 given for M. Drzewiecki's original treatment of propeller design should read 1892. In that year M. Drzewiecki presented two papers, one entitled "Memoire sur une methode pour la determination des element mecanique helicoidaux" on April 4, to the French Academie des Sciences, and another entitled "Une methode pour la determination des elements mecaniques des propulseurs helicoidaux" on December 15, to the French Association Technique Maritime.

A New Passenger Height Record Claim

RECORD-BREAKING is well under way again in France, and on August 13 Lieut. Weiss, accompanied by his mechanic Bégué, claims to have climbed to a height of 9,000 metres (29,700 ft.) in 52 mins. Altogether the machine was in the air for 1 hr. 40 mins., starting from and returning to Villacoublay. The barograph is now being examined and tested by the Aero Club of France.

The 300-h.p. Renault motor on the Breguet was fitted with the Rateau turbine compressor, to compensate for the difference in atmospheric pressure at the great height. At the top of the climb the temperature was 30 degrees below zero.

The previous record in France was that of Walbaum, 7,800 metres, as recorded in last week's *FLIGHT*.

From Paris to Africa

AT five minutes past midnight on August 10-11 the Farman "Goliath" set out from Toussus-le-Noble and arrived at Casablanca on the N.W. coast of Africa at 5.30 p.m. on August 11, having covered the distance of 2,050 kiloms. (1273½ miles) in 17 hrs. 25 mins. The route traversed was via Bordeaux, Biarritz, Madrid, Cadiz and Tangier. This is claimed as a record for a non-stop flight with a machine carrying

eight persons on board. The pilot was Bossoutrot, and the other passengers were Coupet, assistant pilot; mechanics Mulot, Jousse and Coupet; Capt. Bezard, representing the Director of Military Aviation; Lieut. Boussot, representing the civil aviation authorities and Lieut. Guillemot, wireless operator.

On arrival at Casablanca it was found that there were still 400 litres of petrol left out of the 1,700 litres which were put into the tanks at Paris.

At 11 a.m. on August 14 the machine set out to go across the Sahara to Dakar, but for that portion of the journey rifles and ammunition were carried as a precaution against hostile Arabs should a forced landing be necessary. It landed at Mogador from whence it started the following day. It was seen at Port Etienne, 750 kiloms. from Dakar, but nothing has been heard of it since.

Paris to Copenhagen

ANOTHER Farman "Goliath" on August 12, set out from Paris to fly to Copenhagen but had to land at Utrecht, the journey to the Danish capital being completed the next day. The machine was piloted by D'or, and the persons on board were M. Paulin Krauss, a journalist; M. Deseaux, of the Danish Embassy, with French and Danish diplomatic dispatches, and mechanic Leclerc.

Arc de Triomphe to be Closed

FOLLOWING on the exploit of Sergt. Godefroi, the military authorities in Paris have issued orders that the chains enclosing the Arc de Triomphe are to be replaced. No more troops are to be allowed to pass through the arch.

Washington-New York Record

LAST week Col. S. B. Claggett, on a De H machine, succeeded in beating the record set up by the aerial mail planes between Washington and New York. He covered the 210 miles in 1 hr. 15 mins.

U.S. Aviators Seized by Bandits

A NEW turn in aerial warfare was recorded in a message from Washington, which stated that two U.S. flying officers, Lieut. Paul Davis and Harold Peterson, who were reported missing on August 10, were captured by Mexican bandits, who were holding them to ransom for \$15,000 in gold. They were threatened with death if the money was not paid by August 18. The cash was collected and handed over on August 19; the two officers were then released, and arrived safely at Marfa, Texas. Afterwards they accompanied the cavalrymen who were sent out in pursuit of the bandits.

The Spad-Herbemont Height Record

IN the inscription to the illustration of the Spad-Herbemont biplane appearing on page 1092 of our last week's issue the altitude attained by this machine was, through a slip of the pen, given as 89,200 ft. Some record! This should, of course, read 29,200 ft.

CORRESPONDENCE

LORD WEIR'S PAPER AND THE NAPIER "LION"
[1979] We have read with interest the article by the Right Hon. Lord Weir of Eastwood in your issue of the 7th dealing with the progress in engine design.

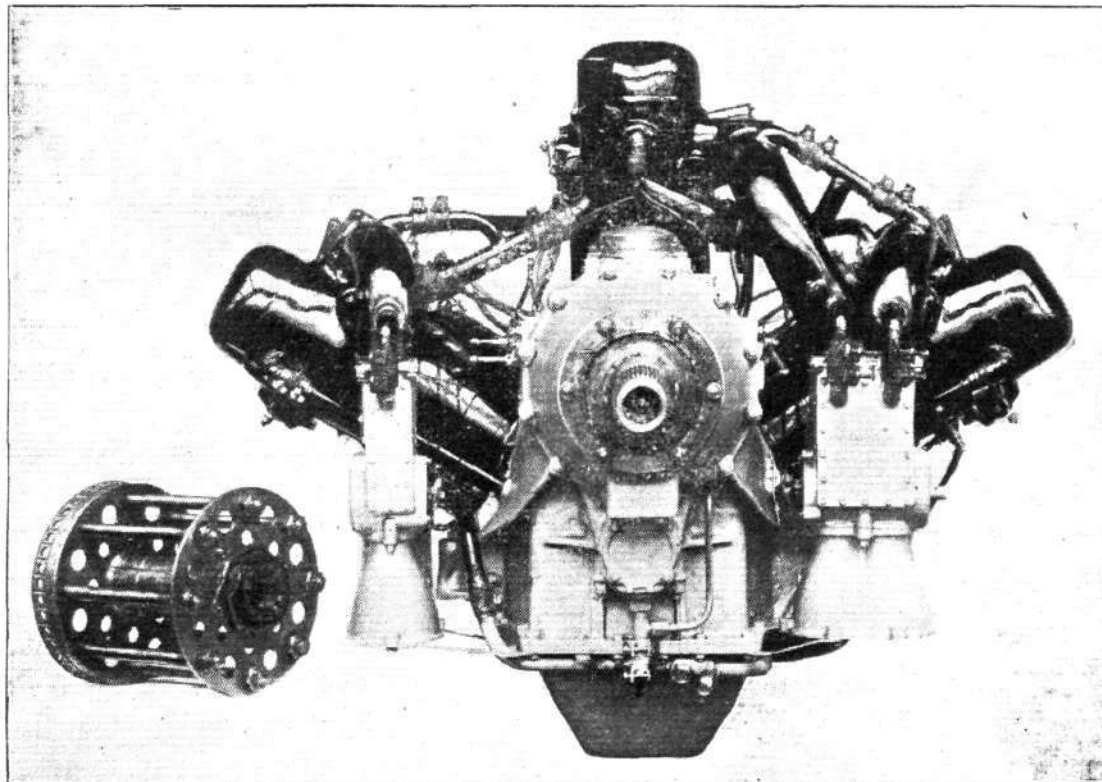
We would point out, however, one or two serious errors which have arisen in connection with the Napier "Lion" engine, especially as weights are shown in comparison with others.

On page 1,051, the tabulated comparisons, giving the leading

described as three rows of four "broad arrow," 60 deg. between vertically and inclined cylinders.

The maximum brake horse-power is also given as 468, whereas a fair average of engines on test is 500, and in many instances even higher horse-power has been obtained.

On page 1,050 an illustration is given, described as the Napier "Lion," but this illustration is of the first experimental engine of this type which was manufactured. We enclose an up-to-date photograph taken from approximately



The Napier
"Lion" engine,
reference to
which is made by
the Napier Co.

particulars of representative British aero engines, give the normal propeller speed of the Napier "Lion" engine as 840 and the dry weight in pounds as 1,318. These figures should be reversed, as the dry weight in pounds of the engine is 840 and the normal propeller speed 1,318.

The engine is described under the heading of type as three rows of four "V." It would, however, be more correctly

the same position, from which the principal exterior difference in regard to the very much neater arrangement of carburettors will clearly be seen. The engine illustrated was manufactured as long ago as 1916, and is therefore considerably out of date.

D. NAPIER AND SON, LIMITED,
A. F. SIDGREAVES, Assistant Manager.

14, New Burlington Street, W., August 11.

THE "SEABIRD'S" LONDON-MADRID NON-STOP FLIGHT.

THE pilot's report of the recent non-stop record flight from London to Madrid made by the Alliance biplane shows that the flight was remarkable in many ways. This machine, which was fitted with a 450 h.p. Napier "Lion" engine, was originally designed for the Transatlantic flight. The pilot and navigator, Lieut. W. R. Curtis, R.A.F., was lent by the Air Ministry to the Alliance Co. for the purpose of making this flight. He had with him Mr. J. A. Peters, the designer, as assistant pilot.

The following notes are taken from the pilot's report:—

"We left Acton Aerodrome at 7.30 a.m., steering a course for Havre. A heavy ground mist made visibility poor, and at times completely obscured the ground from view.

"7.55 a.m. passed over Brighton at 10,000 ft., where visibility improved, until half-way across the Channel, when thick clouds again obscured the water from view.

"8.50 a.m. passed over Havre, which we just sighted through a break in the clouds. Course was altered here for San Sebastian, and we gradually decreased our height to 6,000 ft., flying just below the clouds, which were very broken.

"At 11.10 we passed over Rochelle; just after leaving this place we ran into very bad weather, the clouds being very thick and ranging from 2,000 to 10,000 ft. in depth. After having a very bad time in thick clouds we eventually found ourselves at 2,000 ft., flying just below them in most terrific bumps, which almost made the machine uncontrollable. After experiencing this for some time, we decided to go out to sea and get clear of the land.

"Here we found much better conditions, the sky being almost clear.

"We climbed to 13,000 ft., and passed over San Sebastian at 1.10 p.m.

"Course was altered for Madrid, and the land again became obscured from view owing to very heavy clouds.

"Nothing was seen of the Pyrénées, and the first land sighted at 2.20 p.m. when the clouds began to break up, Madrid being sighted at 3.10 p.m. and we landed at Cuetro Vientos Aerodrome at 3.28 p.m., having completed the journey in 7½ hrs."

The "Felixstowe Fury" Crash

At the inquest, on August 12, on Lieut. S. E. S. MacLeod, who was killed in the crash of the "Felixstowe Fury," as recorded in our last issue, no further light was thrown upon the cause of the accident. A verdict of "Accidental Death" was recorded.

Fatal Accident at Maidenhead

At the inquest at Maidenhead on Lieut. Herbert Stanley

Morris, R.A.F., who was killed in an aeroplane crash at Hurley on August 14, it was stated that he was looking forward to a flight to Fiji next month with a brother officer.

Capt. R. S. Aitken, of Netheravon, Wilts, said he instructed Lieut. Morris to go up for landing practice and told him he was only to go round and round the aerodrome. It was no part of his duty to go to Maidenhead. The inquest was adjourned.

SIDE-WINDS

In connection with the recent non-stop flight of the Alliance Aeroplane Co.'s "Seabird" from London to Madrid the aviators concerned (Capt. W. R. Curtis, the pilot, and Mr. J. A. Peters, the designer of the machine, who was also the observer on the journey) have written to Messrs. S. Smith and Sons (M.A.), Ltd., congratulating the firm on the successful performance of their instruments and accessories. They say that they relied entirely upon the Smith compasses for navigation, owing to the land and sea being at most times completely obscured by heavy clouds. During their flight over France, at an average height of 10,000 ft., when they had only occasional glimpses of the country, and again in their flight over Spain at a height of over 13,000 ft., owing to the dense clouds below they had no opportunity of checking their course, and it was due to the accuracy and dependability of the instruments that they were able to reach Madrid in record time. The instruments fitted to the machine supplied by Messrs. Smith were:—Smith revolution indicator; Smith air speed indicator; Smith altimeter; Smith time-of-trip clock; Smith lateral clinometer; Smith binoculars; Hughes long-distance compass, pattern No. 253; Hughes navigation charts.

In addition to the successful performance of the instruments the aviators expressed their appreciation of the excellent performance of the "K.L.G." sparking plugs, for which Messrs. Smith and Sons (M.A.), Ltd., are the world's sole distributors. They say that the engine ran perfectly and never missed fire once on the entire journey. This is a record of which Messrs. S. Smith and Sons must feel very proud.

MESSRS. GENT AND CO., LTD., inform us Mr. A. E. Eats has resigned his position as London Director and Manager, and is no longer connected with the Company.

SOME changes fall to be recorded in connection with the British Anzani Engine Co., Ltd. We are informed that Mr. A. M. Ramsay, who was formerly General Manager, has resigned all connection with the company, which is now under the joint direction of Mr. Hubert Hagens and Mr. Richard H. Simpkin.

INCIDENTALLY we learn that all types of Anzani engines have been officially approved by the Civil Aviation Department of the Air Ministry, and as this is believed to be the first official intimation of the kind, the firm are naturally proud of the distinction. It is the just reward of the progress and development which has gone on in connection with these engines since the time when a 25 h.p. three-cylinder Anzani engine enabled M. Louis Blériot to make the first flight across the English Channel.

FROM an announcement which appears elsewhere it will be seen that the private owner who wishes to have a small machine for his own purposes has an opportunity of securing a bargain. The London and Provincial Aviation Co., Ltd., have three 50-h.p. Gnome two-seater fuselage biplanes for disposal on very reasonable terms. They are very well built and give a very good performance considering their low power. The firm will be pleased to answer any enquiries addressed to them at the Stag Lane Aerodrome, Edgware.

ONE D.H. 9A, with "Liberty" engine, piloted by Mr. Banting, M.O.B.M., and one "Bristol" fighter, with B.R. engine, pilot, Capt. Leacroft (M.C. Bar), both used Castrol "R" in the flight in which the telephone messages were exchanged with the Houses of Parliament.

ON Saturday last H.M. the Queen of Spain was graciously pleased to accept a gold cup as a small souvenir of the arrival of the first commercial aeroplane to fly a direct non-stop run between London and the Spanish capital. The cup was presented by the pilots, Capt. W. R. Curtis, R.F.A., and Mr. J. A. Peters, the latter of whom is also the designer of the "Seabird." At the same time her majesty was handed a letter from her mother, H.R.H. Princess Beatrice, which was also taken over by the "Seabird."

MESSRS. WARING AND GILLOW, LTD., who control the Alliance Aeroplane Co., purpose opening up aerial communication between their various houses upon the Continent and elsewhere—the London-Madrid flight being the initial trip.

PUBLICATION RECEIVED

The Future of Aerial Transport. Reconstruction Problems No. 34. London: H.M. Stationery Office. Price 2d.

Aeronautical Specifications Published

Abbreviations:—cyl.=cylinder; I.C.=internal combustion; m.=motors.

APPLIED FOR IN 1917

The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

Published August 21, 1919

- 18,845. G. H. THOMAS and B. C. HUCKS. Starting engines of aeroplanes. (130,019.)
19,016. F. W. LANCHESTER. Attachment of propellers. (130,025.)
19,138. VICKERS, LTD., and H. A. SAVAGE. Control of aircraft engines. (130,030.)
19,300. A. A. STARRING. Bomb dropping apparatus. (130,034.)

APPLIED FOR IN 1918

The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

Published August 21, 1919.

107. C. T. G. BAKER and A. S. FLETCHER. Machine gun synchronising means for firing between propeller-blades, etc. (130,037.)
123. BLACKBURN AEROPLANE AND MOTOR CO. and H. BOOTH. Tail surfaces of hydro-aeroplanes. (130,041.)
194. SOPWITH AVIATION CO. and A. J. MILLS. Turn-buckles. (130,043.)
440. BLACKBURN AEROPLANE AND MOTOR CO. and H. BOOTH. Indicators of speed of revolution of aero engines. (130,054.)
441. BLACKBURN AEROPLANE AND MOTOR CO. and H. BOOTH. Tail planes. (130,055.)
592. BLACKBURN AEROPLANE AND MOTOR CO. and H. BOOTH. Altimeter. (130,057.)
593. BLACKBURN AEROPLANE AND MOTOR CO. and H. BOOTH. Air-speed indicators. (130,058.)
705. F. W. LANCHESTER. Launching apparatus for aeroplanes. (130,070.)
721. F. M. A. PINEL. Dirigible balloons. (130,071.)
789. W. F. W. DAVIES. Control of aeroplanes. (130,072.)
796 and 768. H. O. SHORT. Floats or boats for aircraft. (130,073 and 130,075.)
707. H. O. SHORT. Indicators of rate of ascent or descent of aircraft. (130,074.)
810. BRITISH THOMSON-HOUSTON CO. and A. P. YOUNG. Level indicator. (130,076.)
871. SOC. ANON. L'HELICE INTEGRALE (ANC. ETAB. L. CHAUVIERE). Supporting surfaces of aeroplanes. (130,080.)
873. F. J. J. GIBBONS. Apparatus for releasing bodies from aircraft. (130,081.)
918. W. TAYLOR. Clinometers, etc. (130,082.)
930 and 999. E. LETORD. Radiator screens for aircraft. (130,083 and 130,085.)
1,462. W. BEARDMORE AND CO. and G. T. RICHARDS. Gun mountings. (130,097.)
12,003. NAAMLOOZE VENNOOTSCHAP BERENDONCK'S SECTION TYRE SYND. Tyres. (120,374.)
12,017 and 12,018. W. T. REID. Controls for aeroplanes. (130,141 and 130,142.)
12,028. G. A. HIRST. Inclination indicator for aircraft. (130,143.)
15,417. J. O. CLAXTON. Instrument for calculations in air navigation. (130,206.)
15,726. W. WALLACE. Joint manual and power control for aeroplanes. (130,213.)

If you require anything pertaining to aviation, study "FLIGHT's" Buyers' Guide and Trade Directory, which appears in our advertisement pages each week (see pages xlix, 1, li and lii)

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IN order that "FLIGHT" may continue to be published at the usual time, it is now necessary to close for Press earlier. All Advertisement Copy and Blocks must be delivered at the Offices of "FLIGHT," 36, Great Queen Street, Kingsway, W.C. 2, not later than 12 o'clock on Saturday in each week for the following week's issue.

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